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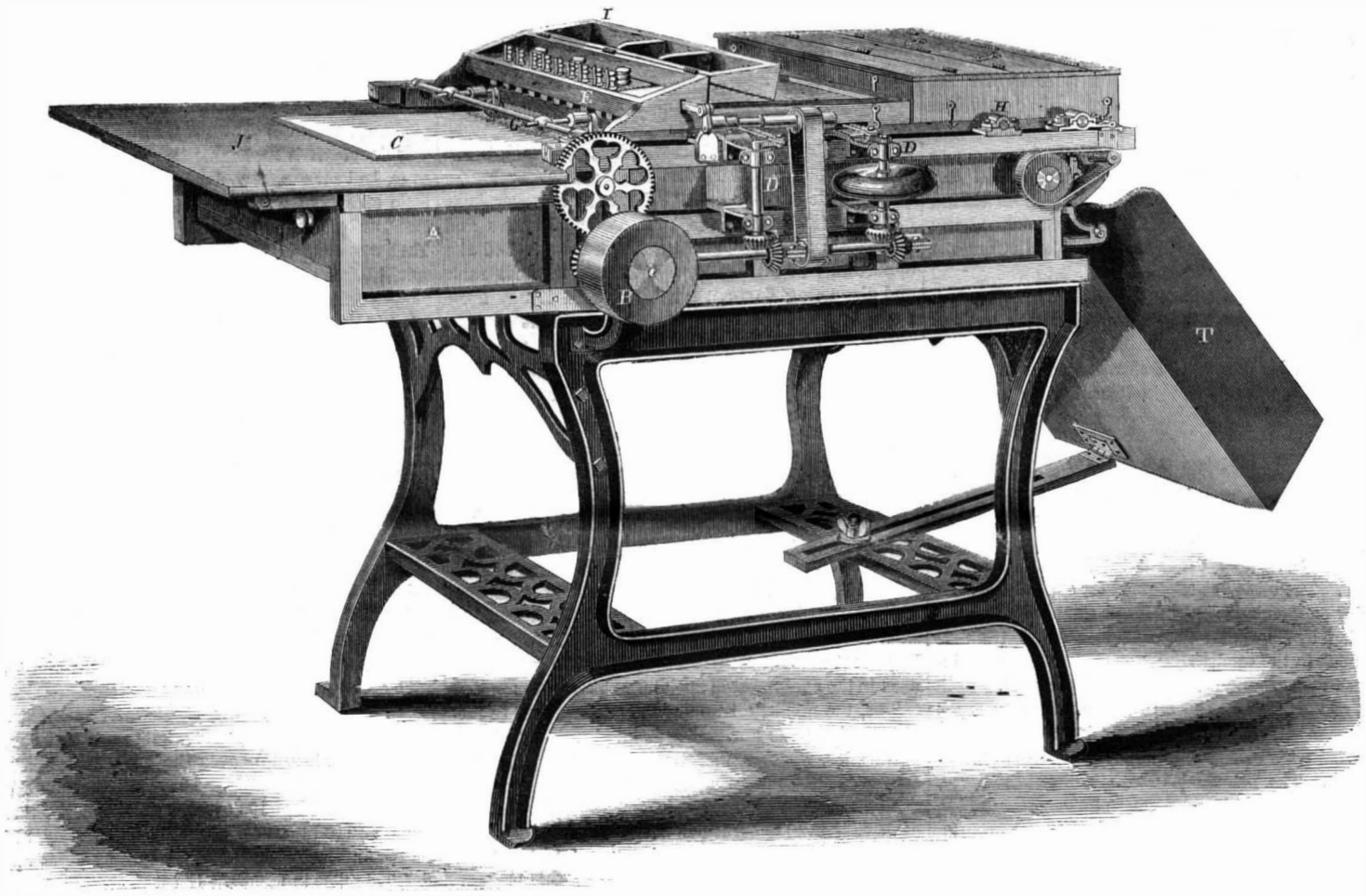
Improved Bronzing Machine.

The common method of applying bronze by hand to printed sheets, with pads made of fur or velvet, is the one used in nearly all printing offices; those who have much of this kind of work to do can bear testimony to the annoyance and waste arising from the bronze dust blowing about and soiling everything with which it comes in contact. If we add to this the unhealthiness of the operation, and the repugnance of help to do the work, it becomes one of the most distasteful jobs that a printer has to do. The machine here illustrated obviates all these evils, does the work as handsomely and more rapidly than it can be done by hand, and without any waste of bronze.



TAPLEY'S BRONZING MACHINE.

The appended description will render the machine intelligible. A is the frame or box inclosing and supporting the machine, and there is a roll receiving motion from the driving pulley, B, carrying an endless apron, C, upon which the sheets to be bronzed are carried through the machine. D D are crank shafts which work several pads lying upon the apron, at right angles with it, for the purpose of distributing the bronze and rubbing it on the printed surface. E E are boxes containing the bronze, which is sifted through tubes on to the paper as it passes into the machine. G is a shaft to which are attached two movable rollers which can be adjusted to run on the edge of a printed sheet of any size, and serve to hold it in place until it passes under the pads. Between the pads are other rolls, resting upon the apron, and driven by its motion, which hold the shafts in place as they pass under the pads. At the back part, H, of the machine, are three rotary fur brushes, between which the sheets pass, and from which they are delivered into the hopper perfectly clean on both sides; I is the top of the case which covers the bronze boxes, thrown back to show them more fully.

The printed sheets to be bronzed are placed on the feed board, J, and passed in singly. They receive the bronze from the boxes, in their passage, which is distributed and rubbed on to the printed surfaces by the pads when the sheets move under them. As they continue on between the fur rolls, they are dusted on both sides and delivered perfectly clean into the hopper, as before stated. The bronze dusted from the sheets finds its way to a drawer at the bottom, whence it can be taken out and used again.

Two of these machines have been in successful operation, for more than six months past, in one of the largest general printing offices in New England. One has been running exclusively on album pages and the other on general job work, and they are found indispensable auxiliaries in the office.

These machines are capable of bronzing and dusting from 500 to 1,500 impressions an hour, and are always ready for instant use. Being so simple in construction and so economical, they can hardly fail to come into general use in all well appointed printing establishments.

This machine was patented on the 22d of December, 1863, and any further information in regard to it can be obtained by addressing the inventor, J. F. Tapley, & Co., of Springfield, Mass.

JOHN LEECH, the well-known humorous artist of *Punch*, is dead.

On an Ancient Factory of Flint Implements.

Doctor Leveille, a physician at Grand Pressigny (Department of Indre-et-Loire, in France), has recently discovered near they which upon the lands of Claisiere and of the Doucetterie, an ancient manufacturing place of flint implements, exceeding in importance and interest anything of the kind before known. Vast quantities of chips of siliceous stones, of arrow heads, hatchets, knives 15 to 20 centimetres long, of lance-heads, etc., have been obtained from it. Cut stones (*noyaux tailles*) of prismatic shape and about 20 centimetres long, are especially abundant; they occur by thousands over an extent of 5 or 6 hectars. The collections from Abbeville and various caverns, which have excited so much attention, are nothing compared with the accumulations at the workshop of Pressigny. Only a few polished objects have been met with. Dr. Leveille has found, however, a hatchet polisher. It is a block of sandstone, 40 to 50 centimetres long and 25 to 30 broad, marked throughout with furrows, angular in section, in which the hatchets were polished by friction, after they had been rudely shaped by hammering. It is certainly one of the most curious of the implements of this primitive branch of industry.—*Les Mondes.*

THE Irasburg, Vt., *Standard* says:—"We were last week shown specimens of gold taken the week previous in Troy, by Mr. Albert Hobsden, of that town, who dug about twelve dollars in three days. The gold is quite fine. He has bonded some 700 acres of land, and is making extensive preparations to mine it next summer."

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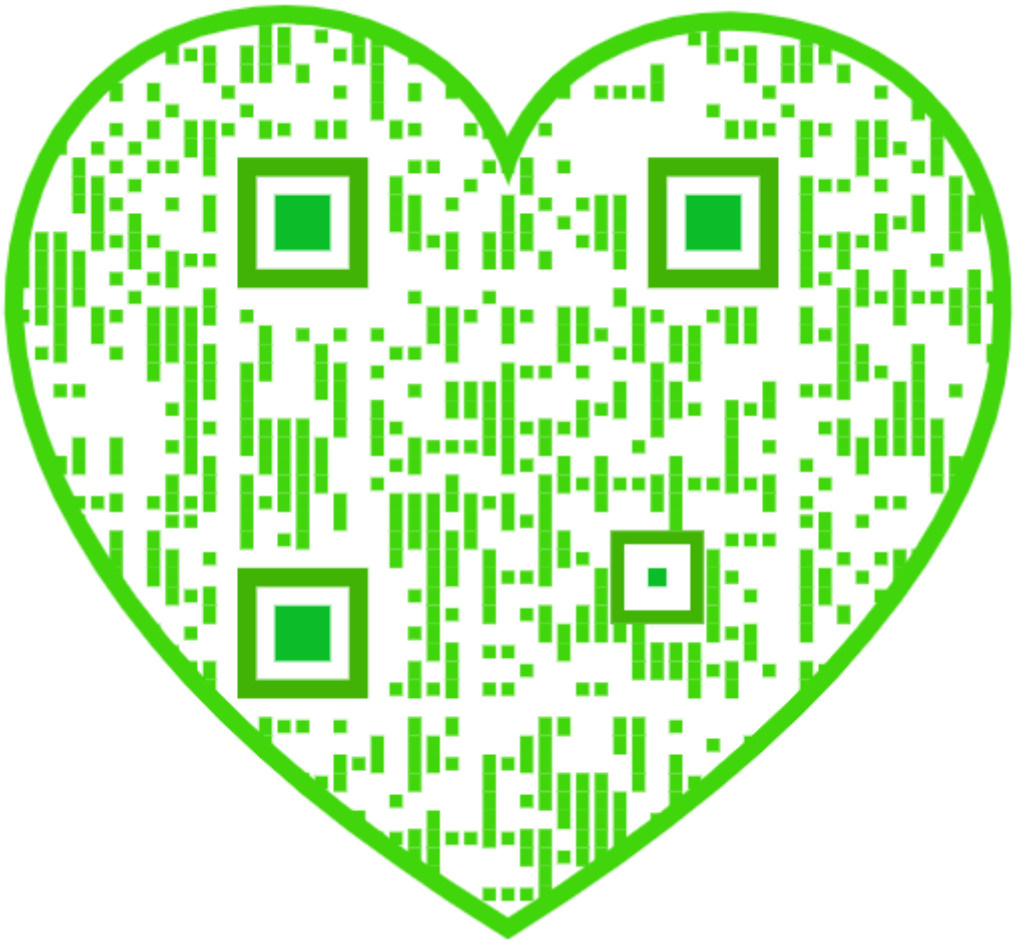

How to Make Apple-butter.

Place a large copper or brass kettle, well cleaned, over the fire; fill the kettle with new cider in which fermentation has not begun. When it comes to a simmer begin to skim off the scum. As it boils down fill in more cider and skim as before until you have in the quantity you wish to boil. A barrel and a half can be nicely done in what is commonly called a barrel kettle. When the cider is boiled away one-half, or more, dip out six or eight gallons into earthen or stone jars, then fill in for each barrel, or thirty-two gallons of unboiled cider, one and a half bushels of quartered apples, nicely washed and drained. If the apples are not all put into the kettle at the same time, replace the apples and the cider taken from the kettle as soon as there is space to receive it. Have a slow fire under the kettle while the apples are dissolving to prevent running over. When well dissolved it must be constantly stirred until finished. This is done with an implement made as follows:—Take a piece of soft wood, two feet long, one and one-fourth inches thick, two inches wide at top end, four at the bottom, which should be oval; now have a hole at the top, one and one-fourth inches in diameter, and place a handle into it eight feet long. This will enable the operator to stand away from the fire and yet move it over every part of the bottom of the kettle and thus prevent its burning. No burning wood should touch the kettle, neither should the blaze rise above the boiling mass. One barrel of cider and one and one-half bushels of quarters boiled down to about ten gallons, can be kept one or more years. For winter use, two bushels of quarters may be used, and less boiling is required. Before taking it from the fire, season with spice, cinnamon, and cloves, to suit the taste. Remove the kettle from the fire, dip the apple-butter, while hot, into well glazed crocks or stone jars, then set away to cool; when cold, cut paper covers for each crock or jar, soak it in whiskey, lay it into the vessel on the apple-butter, and the work is done. Cider made from sour apples, and sweet apples boiled in it, makes an excellent dish.

African Oil Seeds.

Of fruits, seeds, etc., having oleaginous properties, there are many. Cocoa-nut, sesamum, and ground nuts are all articles of export from Zanzibar, chiefly to Marseilles. The cocoa-nut grows in immense forests. The oil is not expressed for exportation, but the dry copperah is sent in large quantities for expression by European machinery; a large trade is also done in the seed of the sesamum (sesamum indicum), and ground nuts (arachis hypogæa). Both these oils are well-known in this country, as much in the manufacture of soap as for burning in lamps. Sesamum oil is also much employed for adulterating olive oil. The principal African oil seed, however, is that now so well-known and so extensively used in the manufacture of candles, the elais guineensis. This is a native of Western Africa, and is imported into Liverpool in immense quantities. The introduction of this oil by Price's Patent Candle Company has been the means of giving employment to thousands in this country, as well as of establishing a profitable speculation in Western Africa, and in some measure supplanting the slave traffic. Of seeds which are at present quite unknown in commerce, but which would appear to have great claims upon the attention of the soap and candle-maker, may be mentioned firstly, those of trichilia capitata, known on the Zambesi as "motsakiri" seeds; these are small black seeds about half an inch long, and contain a large quantity of solid fat, which would, no doubt, prove a valuable addition to our oil seeds were they exported. These seeds are the produce of a large, handsome tree, growing abundantly in the vicinity of rivers. The natives apply the wood to the manufacture of small canoes. The castor oil is also found growing wild in this part of Africa, and attains a hight of from 12 to 14 feet. On the west side of Lake Nyassa, Dr. Kirk discovered a small oil palm, in habit quite unlike that of the West Coast, but more resembling the date palm. The albumen was found to contain an abundance of oil, very similar to palm oil. It is not known to be in use in any way whatever among the natives. The tree, which grows to about 40 feet high, was not seen in great abundance anywhere. A nut much resembling an almond, both in shape and size, and called by the natives "boma nut," yields an abundance of a sweet fluid oil, much used by the natives in their cooking. The fruit itself, with the fleshy covering, is about the size of a walnut. The natives cultivate the trees abundantly near the Victoria Falls. It is also found in the Shire Valley, but does not extend further south than Lake Naomi; it is probably a species of vitex. Moringa pterygosperma is another good oil seed, but it is found only in the neighborhood of villages, and has probably been introduced. In Western Africa the seeds of carapa guineensis furnish an oil much in use amongst the natives for burning in lamps, and also for anointing their bodies. In Sierra Leone it is given as a purgative medicine, one tea-spoonful being considered a dose. It is imported into the south of France for soap-making. The seeds of carapa touloucouna also contain a large quantity of oil, the residual nut, after expression, making a good oil-cake for cattle. This plant is a native of Senegambia. The seeds of the bassia parkii are well known as furnishing the shea butter of Western Africa. Mungo Park, in writing of this vegetable fat, says that the natives were then "employed everywhere in collecting the fruit of the shea trees." The butter or fat, which is contained in large quantities in the seeds, is extracted by boiling in water, and is afterwards bleached. This butter is in great request by the natives for many domestic uses, and it forms one of the principal articles of inland commerce. The above-mentioned writer, speaking in high praise of the delicious flavor of this butter, says: "It is whiter, firmer, and, to my palate, a better flavor than the best butter I ever tasted made of cow's milk." I cannot, however, bear out this testimony, except as to its firmness and whiteness; for the specimens which I have had the opportunity of tasting have been of the most rank and disgusting flavor, though it is said it will keep perfectly sweet for several months. But if this butter or fat is not suited to a refined palate, it seems to have many advantages as an article of commerce, and would, no doubt, prove a valuable import for the purposes of soap and candle making.—*Jackson in Technologist.*

The Saddlery and Harness Trade Helped by the War.

The saddlery and harness business has found its sources of profit largely extended, and its permanent prosperity placed on a more healthy and enduring basis, by the increased demands and enlarged market which the necessities of the war have thrown open. The great amount of harness and saddlery material used in the equipment of such large bodies of mounted troops, the artillery trappings necessary, and to furnish the immense and well-appointed wagon trains of our armies, whether in Missouri, Kentucky, Louisiana, Texas, Tennessee, or in Virginia, has been equivalent to just so much entirely unlooked-for and positive increase—for it has been such as could not be diverted from other channels—therefore forming a demand independent of that which had existed before, and in addition thereto.

The industry of the country, as developed in its farming operations and the immense business which our widely-spreading emigration opened up, was hardly checked at all by the commencement of the civil war, while the great advance in the price which we must pay for all foreign articles of trade has given our own dealers almost exclusive control of a market surpassingly rich. One large importing house, in particular, about the time of the commencement of the war, had a heavy amount of saddlery hardware, their stock of bits alone footing up to more than sixty thousand dollars worth, which they were at that time anxious to dispose of at low rates, and would have sold some articles at a sacrifice, as the stock in market was considered so large; but from the demand which has all the time since prevailed, and the good prices which goods have realized from the first three months of the war, their anxiety was shown to be without just cause, and they have realized an unexpected harvest.

The foreign market for these goods seems to have prospered, also, nearly as well as our own. In France the trade in all kinds of leather manufactures has been excellent, but in none have so decided an improvement been manifested as in that of saddlery and harness. The colonial possessions, so limited now, but which the French Government has expended so much money and manifested so much zeal in fostering, are the proper market for their increased production, and we hear that a large business in this branch of the trade has already been opened in the Mexican market. With the security of an established government, able to secure dealers in the possession of their lawful property, this will be an enduring and most profitable market. With comparatively few railroads, so large an amount of traveling over a mountainous country, with pack-horses and mules universally used, the saddle and harness-maker's arts are indispensable at every step.—*Shoe and Leather Reporter.*

Trifles.

It was not long ago that a large tract of reclaimed land was shining in all the richness and beauty which good farming and rich crops can give. A large sluice-gate kept out and regulated the once triumphant waters. In one day, almost in one short hour, this beautiful extent of land was covered with the again triumphant waters, and acres upon acres inundated, crops destroyed, and many a hard-working agriculturist brought to the verge of ruin. The embankment had given way, the sluice-gate washed from its bearings, and the water again, with a mighty roar, as if exulting over man's carelessness, rushed over its old possessions. It could n't be helped. It was no one's fault. Who would have thought it? Such, probably, were the excuses made after the mischief was done. It is true some one, perhaps several persons, had seen a few days before, that there was a little stream of water spirting through the embankment or by the side of the sluice. But what of that? That was only a trifle, quite a little thing; no one would think anything of that; and yet what are the consequences? Those who saw what eventually led, what if they had thought about it they would have known would be sure to lead, to such a dire catastrophy, what was really but the beginning of the end, never said a word about it; and if they had, those to whom they told their tale would have echoed back the stereotyped observation, "Little things like that are of no importance," or words to that effect, and would have given no more thought to the subject till the final blow came.

Water Supply of London.

At the beginning of the present century the water mains of the City of London were wooden—the trunks of trees bored out—and in no case of more than one foot in diameter. How the metropolitan giant must have grown, the size of his present iron arteries is a proof. The mains of the eight water companies not only supply London proper, but push out far into the country, invading even the agricultural districts, and supplying its farms. They distribute in the aggregate upward of 100,000,000 gallons daily, through 3,000 and odd miles of main, and supply 375,000 houses and factories, through capillary pipes upward of 7,000 miles in length. If all the water daily used in this great city were collected in one great reservoir it would cover seventy acres in extent and six feet in depth. As the spectator watched this great expanse of water he would see it hour by hour draining to the bottom by the collective millions in the metropolis as calmly and noiselessly as a cup is drained by a dusty roadside traveler. The collective iron heart, the steam engines which propel this flood, possesses a force of not less than 9,000 horses.

New Steamship Company.

THE American Shipbuilding Company has been organized in this city, with a capital of $1,000,000, for the purpose of building ships and steamers of all sizes, including merchant vessels, monitors, iron-clads, yachts, &c., upon the newly-invented models of Captain Augustus Walker, of Buffalo. Several prominent shipbuilders and machinists have taken a lively interest in this enterprise, which promises to be one of much importance to the advancement of the science of naval architecture. The following is a list of the officers of the company:—President, David Ogden; Vice President, Horace H. Day; Secretary, Charles B. Norton; Naval Constructor, Augustus Walker. The Company are about to construct an ocean steamer of about 900 tuns for the coasting trade.

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MISCELLANEOUS SUMMARY.

CURED BEEF.—A HINT TO INVENTORS.—An exchange says:—"Over four hundred different experiments have been made to cure South American beef, so as to make it a marketable article. A company has been formed in Montevideo to lessen the expense of the experiments and to prepare specimens for trial in Europe. No success whatever has attended the efforts. The article forwarded has been rejected by the French navy, by the hospitals, and everywhere. It seems that the process destroys the life of the meat. An American, Mr. Morris, of New York, has just begun a new system, but the success of the plan is yet to be known. A process by which half a cent a pound could be saved would yield an annual income of millions of gold dollars."

A MODEL STEAMBOAT.—The *Chauncey Vibbard* is one of the fastest steamboats on the North River. In slack water and with no undue pressure, she easily runs from 23 to 25 miles per hour, and even with this speed almost vies with the parallel railroad on the shore. The boat is 280 feet long on deck, 34 feet 9 inches beam, and is 60 feet wide, having 55 inches diameter of cylinder and 12 feet stroke of piston. Her engine and boilers were built by Fletcher Harrison & Co., New York, in their best style and with all the modern improvements.

TO MEASURE CORN ON THE COB.—A correspondent of the Canada *Farmer* says:—"To estimate the quantity of shelled corn on the cobs in any given space, level them, and measure the length, breadth and depth; then multiply these dimensions together, and the product by four. Cut off the last figure and you will have the number of bushels of shelled corn, and the decimal of a bushel. If you desire to know the number of bushels of ears, multiply by eight instead of four."

FOREIGN papers say that nothing can be more magnificent than the vintage this year in all parts of France. In the wine districts there is a superabundance of grapes. The proprietors of vineyards are actually puzzled to know what to do, their usual supply of casks having long been filled, and the coopers, although at work day and night, being utterly unable to supply the demand.

FEMALE BUFFALO SKINS.—At the last meeting of the Polytechnic Association the President stated, on the authority of a taxidermist familiar with the subject, that the buffalo skins received in our markets are all skins of the female. The skins of the male are too thick to be suitable for robes, and if they are shaved down to a proper thickness the hairs come out so much as to spoil them.

A MINIATURE telegraph office, designed for a present to the Emperor of Russia, has been prepared by an artisan of this city. It consists of a complete telegraphic apparatus, capable of transmitting messages between this city and Boston, all embraced within the compass of a morocco case eight inches in length, six inches in width, and three and a half inches in depth.

THE coal deposits in Rhode Island continue to attract a good deal of attention, and bid fair to add materially to the wealth of the State. A new vein has just been opened near Newport, which promises better than any that has heretofore been found.

W. W. WADE, of the Amoskeag Gun Works, Manchester, has perfected a breech-loading rifle which throws fourteen bullets without reloading. The piece weighs only eight pounds.

THE coal fields of Pennsylvania have yielded, on an average, two hundred and thirty thousand tuns of coal per week for the last three months. If they yielded a million tuns it would be no cheaper.

A LARGE telescope is being manufactured at Springfield, Mass., the tube of which, a splendid piece of mahogany, was formerly one of the pillars to the pulpit in the old church at Northampton, Mass.

A LAND sale at the incredible rate of £300,000 per acre, or $2,800 per foot frontage, took place in London lately, when two large houses in Old Broad street were disposed of.

IT is said that upwards of 900 women are going out to India, from England, to be employed on various telegraphic lines of communication.

STEEL-CLAD FRENCH LADIES.—The *Progres de Lyons* (French paper) announced some days since that a manufacturer of that town had received an order for 300,000 kilogrammes of steel hoops for crinolines (there are 45·35 kilogrammes in 100 lbs. avoirdupois). The *Nord* remarks that this figure, which appears extravagant, is far from representing the full amount of steel used for ladies' petticoats. One house in Paris sells annually 600,000 kilogrammes weight of hoops. To give an idea of this trade, which sprung up with the use of crinolines, it is only necessary to consider that every woman possesses one or two hooped petticoats, each of which contains from 20 to 30 yards of metal, weighing on an average 1 lb., and as the adult French female population is at least 12,000,000, there are 12,000,000 kilogrammes of steel placed annually at the service of the fairest half of the French people.

SCARCITY OF FIREMEN.—The English *Army and Navy Gazette* says:—"In reference to the scarcity of stokers which is said to exist in the navy, we are assured that we have understated the case; and as regards her Majesty's ship *Victoria* alone, we are credibly informed that if she were now sent to sea, she would have to take her departure with three-fourths landsmen to perform duties which can only be efficiently got through by experienced people. The position of the *Victoria* in the trough of a heavy sea in the Bay of Biscay, with a sick crew from the quarter deck to the stoke-hole, would be a sad reflection upon us as a nation which aims at dominion on the sea."

THE NEW FRACTIONAL CURRENCY.—The plates of the new fifty cent fractional currency are nearly ready for printing. These notes will be of the same breadth as those now in circulation, but nearly twice as long. The new five cent notes will be of the same size as the old ones, while the ten and twenty-five cent notes will be of lengths graduated between the highest and lowest denominations. It is probable that a three cent note will be issued, for the greater facility of making change.

FROM San Francisco we learn that the monitor *Camanche*, which was sunk in the harbor of that place some time ago, was successfully launched on Monday the 14th inst.

IN the southeastern part of Massachusetts 12,000 person are employed in bonnet factories, and they send away annually nearly 8,000,000 bonnets and hats.

TWO-FIFTHS of an acre of ground in Fitzwilliam, N. H., raised ten and three-quarters tuns of turnips this year.

A VERMONT invention is a churn which makes butter from cream in one minute and a half of churning, and from sweet milk in four or five minutes.

THE total heating surface of the *Dictator's* boilers is 34,000 square feet, not 3,400, as printed.

A PARENTHESIS in composition is a nuisance; good writers never use them.

Explosion of a Gunboat's Boiler.

The gunboat *Tulip* was blown up in the Potomac on Friday, the 11th inst. The cause of the disaster is not stated, but it was doubtless one that frequently attends similar catastrophes—that is, carelessness. There were on board of the *Tulip* at the time of the accident sixty-nine officers and men, including the following:—Acting Master W. H. Smith, who hails from Philadelphia; Ensign Wagstaff, Acting Master's Mates Davis, Reynolds, Roffenburgh, Hammond and Simons; Engineers Parks, Gordon and Teel. When the steamer started there was steam on one boiler only, but before going far steam was raised on the other, and the boat was proceeding slowly up the river. The first intimation of danger was a cry from Mr. Gordon, who was the engineer on watch, to run to the safety valve, and he made his way to the engine room, but scarcely had he gone through the door when the explosion took place. At this time Capt. Smith, the pilot, James Jackson, Master's Mate, and Hammond, the quartermaster, were on the bridge over the boiler, and must have been blown to atoms. The only trace left of Capt. Smith was his hat. As but ten persons were picked up, fifty-nine persons must have lost their lives instantly, and two of those who were saved died before the *Ella* left St. Ingoes. Two or three others of the ten saved are not expected to live, among them is Engineer Teel. Capt. Smith has been attached to the flotilla for about two years past, and was a most esteemed young officer. Engineer G. F. Parks, who was in charge of the engines, and went down in the wreck, hails from Brooklyn, N. Y., where he leaves a wife and three children, with an aged mother. The *Tulip* was one of the vessels built at New York for "Mandarin" Ward, of China, and after his death the Government purchased her, together with the steamer *Funchia*, another of Ward's vessels.

The School of Mines in Columbia College.

The new school of mines just added to Columbia College began its first term on Tuesday, Nov. 15th. An outline of the objects of this school has already been published. Instruction will be given in general and analytical chemistry, assaying, metallurgy, mineralogy (including lithology and the formation of metallic veins), geology, machines, mining, physics, botany and palæontology, machine drawing and descriptive geometry, mathematics and mechanics. The degree of Mining Engineer and Bachelor of Philosophy will be conferred on students who pass a satisfactory examination on the complete course, which will include three terms of six months—from Nov. 15th to May 15th each year—the interval to be occupied in visiting mining districts that may be selected, and making reports of investigations. The instruction given will greatly assist in the development of the rich mineral resources of the country.

The list of officers of the institution is as follows:—F. A. P. Barnard, D.D., LL.D., President; Thomas Egleston, Professor of Mineralogy; Francis L. Vinton, Professor of Mining Engineering; Charles F. Chandler, Professor of Analytical Chemistry; John Torrey, Professor of Botany; Charles H. Cox, Professor of Geology; W. G. Peck, Professor of Mechanics and Mining Surveying; Ogden N. Rood, Professor of Physics; John H. Van Amringe, Professor of Mathematics.

Fine American Tools.

Messrs. Darling & Schwartz, of Bangor, Maine, have forwarded us a specimen of their steel scales, vernier callipers, etc., and an examination of them fully bears out our previous commendation. We knew what they were before, however, not only from their reputation, but from the use of them. Concerning the effect the use of such tools has upon mechanics, we heard one of our manufacturers say, that he recently gave one of the 2-inch rules to each of his boys, and where before a thirty-second was the standard of nicety, he now heard them quarreling over 100ths of an inch. Such fits as exist in the vernier scale sent, are rarely seen in prize goods, but these are samples taken directly from the warehouse, and the same that are sold in the market. Every mechanic should have these scales. We arepleased to know that they took a medal in London atthe International Exhibition of 1862.

SPECIAL NOTICES.

THOMAS J. SLOAN, of New York City, has petitioned for the extension of a patent granted to him on Feb. 25, 1851, and re-issued on March 29, 1853, for an improved machine for arranging and feeding screw blanks.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, Feb. 6, 1865.

PHILO S. BEERS, of Hamden, Conn., has petitioned for the extension of a patent granted to him on Feb. 18, 1851, for an improved machine for turning irregular forms.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, Jan. 30, 1865.

RANSOM COOK, of Saratoga Springs, N. Y., has petitioned for the extension of a patent granted to him on June 17, 1851, for an improvement in augers.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, May 29, 1865.

All persons interested are required to appear and show cause why said petitions should not be granted. Persons opposing the extension are required to file their testimony in writing at least twenty days before the final hearing.

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Boring Artesian Wells.

In the South Wales Institute of Engineers a paper was recently read on this subject by Mr. W. Mather. The *Engineer* (London) says:—

"After referring at considerable length to the Chinese system of boring (which appears to have dated from a very early period), and the attempts more recently made on the Continent and in Germany, he alluded to the present plan adopted by the Continental engineers, known as Kind's system, which is considered to be the perfection of boring machines. The system known as Kind's is still the rod system, with certain modifications to lessen the risks and difficulties in boring to great depths. It was owing to the imperfections of the rod system that the attention of a relative of the writer (Mr. Colin Mather) was first directed to the subject of boring, and after much investigation and experiment, constructed and patented a machine in 1855, and which may fairly claim the name of the "English system," as the only one which has not originated among the Continental engineers. In the boring tool, and the method of giving the percussive action, and also in the shell-pump, especial novelty will be found. Instead of these latter being attached to rods, as in the old system, they are suspended in turn by a flat rope, about ½ inch thick and 4½ inches broad, such as are in common use in collieries, and the boring tool and pump are let down and drawn up as quickly as the buckets and cages in the shaft. The rope is wound upon a large drum by a steam engine with a reversing motion, by which one man can regulate the operation with the greatest ease. . . . . .

The general arrangement of the machine is as follows:—The winding drum is 10 feet in diameter, and is capable of holding 3,000 feet of rope, 4½ inches broad and ½ inch thick; from the drum the rope passes under a guide pulley, through a clamp, and over the pulley, which is supported on the fork end of the piston rod, and so to the end, which receives the boring head, which, being hooked on and lowered to the bottom, the rope is gripped by the clamp. A small jet of steam is turned on, causing the piston to rise slowly until the arm moves the clamp, and gives the full charge of steam; an accelerated motion is then given to the piston, raising the boring head the required hight, when the steam is shut off, and the exhaust opened, thus effecting one stroke of the boring head as regularly as a back-pressure valve in the exhaust pipe. The exhaust port is 6 inches from the bottom of the cylinder; when the piston descends to this point it rests on a cushion of steam, which prevents any concussion. To increase the lift of the boring head, or compensate for the elasticity of the rope, which is found to be 1 inch in 100 feet, it is simply necessary to raise the clamps on the clamp shaft while the percussive motion is in operation. The clamp which grips the rope is fixed to a slide and screw, by which means the rope can be given out as required. When this operation is completed, and the strata cut up by a succession of strokes thus effected, the steam is shut off from the percussive cylinder, the rope unclamped, the winding engine put in motion, and the boring head brought up and slung from the over-head suspension bar by a hook fitted with a roller to traverse the bar. The shell-pump is then lowered, the *debris* pumped into it by lowering and raising the bucket about three times, which the reversing motion of the winding engine readily admits of, and then brought up to the surface and emptied by a very simple arrangement. The rapidity with which these operations may be carried on, proved by experience with the machine, is somewhat as follows:—The boring head is lowered at the rate of 500 feet per minute; the percussive motion gives twenty-four blows per minute. This continued in red sandstone and other similar strata for about ten minutes is sufficient to enable the cutters to penetrate 6 inches, when the boring head is again wound up at the rate of 300 feet per minute. The shell-pump is lowered and raised in the same time, but only remains down about two minutes, when it is withdrawn to empty the *debris*, an operation occupying two or three minutes.

A Petrified Bee-tree.

The Grass Valley *National*, of California, says:—"There was found a few days since, in the diggings of John Chew & Co., on Buckeye Hill, in this county, between Greenhorn Creek and Chalk Bluff Mountain, a bee-tree, with a beehive, honey and bees, all petrified. The remaining portion of the tree in which the beehive was found is 2½ feet in diameter and 40 feet long. Chew & Co., while piping their claims, found the petrified beehive 75 feet beneath the surface. The beehive is no matter of fancy, but of pure demonstration. Before us is a sample of the comb full of honey, all petrified. The normal thickness of the comb, the duplicate of cells with their invariable hexagonal shape, are all before us as distinctly as if a fresh piece of honey-comb, all dripping, and just cut from the box, had been brought and placed before our eyes on a sheet of paper."

Telegraphing by Magneto-Electric Machines.

The following communication to the Washington Daily *Chronicle* is from a learned professor who is known throughout the world for his original investigations in electricity:—

"The introductory report of the Patent Office for 1863 ventured upon the following anticipation:—'It is not too much to say that the days of telegraphing by the galvanic battery are numbered, and that the magneto-electric machine will ere long take its place for this, as well as for many other purposes.' At that time it was well kuown that the magneto-electric machine was successfully working Beardslee's dial telegraph; but we witnessed, last evening, the extraordinary feat of working the Morse telegraph, between Washington and New York, with one of Beardslee's little magneto-electric machines, occupying space less than a cubic foot. The correspondence was kept up over the People's Line with perfect freedom for more than an hour, and the Morse operator rattled off the messages as if he were perfectly at home. The sound of the instrument is musical, differing from that of an ordinary receiving magnet. The Commissioner's report alludes to the firing of gunpowder through the distance of one hundred miles by means of this little machine, but last night we fired gunpowder in New York, a distance of two hundred miles, and the operators there fired gunpowder in Washington with perfect ease by the same little machine used to work the telegraph. It was a perfect success and one of the most interesting and splendid achievements of modern science. If the Atlantic cable is ever laid, this seems the power destined to work it. Surely, 'the days of the galvanic battery seem to be numbered.'

"The invention above referred to is thus described by Commissioner Holloway in his report:—

"Conspicuous among the inventions which have received the sanction of letters patent is a magneto-electric telegraph, now in extensive use in the United States Army for field purposes, and elsewhere for ordinary telegraphic purposes. This is a signal triumph in electro-mechanics, for by the motive power of a small magneto-electric machine, occupying less than a cubic foot, a dial or index telegraph is operated through great distances, from five to two hundred miles, with the prospect of greater and indefinite extension. It was found with the Atlantic telegraph, in 1858, that alternating, or to and fro currents, were indispensable to its operation, and the magneto-electric machine of the telegraph before us has the peculiar movement of normal to and fro currents in rapid succession, without any extra contrivance for their production, this condition growing out of the very arrangement of the magnetic poles and helices. The operators for this telegraph require no training, and any person who can read can telegraph. For the Morse telegraph two or three years of training are required. It is not liable to piracy by tapping, as is the Morse telegraph, and may be justly regarded as the inauguration of a new era in telegraphy, by dispensing with the cumbersome, uncleanly, unhealthy and inconstant galvanic battery as the motive power, and the introduction of a simple and economical telegraph, adapted with equal facility to domestic and public purposes. It is not too much to say, that the days of telegraphing by the galvanic battery are numbered, and that the magneto-electric machine will ere long take its place for this, as well as for many other purposes.

"Another highly interesting development in magneto-electric science is the discovery and application of a new mode of ignition for purposes of blasting with powder. Hitherto torpedoes and other powder blasts, fired by electricity, have depended upon the ignition of a very fine platinum wire. When this had to be done through long circuits, or at great distances, very large and expensive galvanic batteries were required, owing to the great diminution of the quantity of electricity. It was proved by experiments made at the Capitol many years since, that 150 pairs of Grove's battery were necessary to ignite powder by the finest of platinum wires placed in the telegraph circuit between Baltimore and Washington, a distance of 40 miles. By means of this new discovery, powder has been fired through the distance of 100 miles by means of a little magneto-electric machine, occupying less than a cubic foot. This astonishing achievement has been accomplished by means so simple that electricians will wonder as much, if not more, than the uninitiated. It is done by a *pencil-mark*. The stroke of a common black-lead pencil on a block of wood is substituted for the platinum wire, and this disintegrated conductor, as it may be called, is so intensely ignited by the magneto-electric current as to set fire to the wood.

"The application of this ingenious device within a suitably-prepared cartridge, will be hailed as one of the most valuable contributions to mining and engineering operations of the present day."

Beardslee's magneto-electric battery was illustrated on page 353, Vol. V., (new series) of the Scientific American. Since the experiments described above, it has been applied to the line between this city and Buffalo, and one small instrument sent a current through the whole distance, 480 miles, with perfect success.

Our National Currency.

Mr. Chase, Ex-Secretary of the Treasury, in a recent speech at St. Louis, spoke as follows in regard to our national currency:—

"I have been called the father of greenbacks. What is a greenback? Did you ever think what it was? Why, it is simply the credit of the great American people put in the form of money, to circulate among the very people whose credit makes it worth anything. When I was Secretary of the Treasury the question arose, how should these vast armies and navies be supplied? How could the boys be fed in the field, the sailors in ships, and provision made for their support, for their clothing, their food and transportation? I found the banks of the country had suspended specie payments. What was I to do? The banks wanted me to borrow their credit, or pay them interest in gold upon their credit. They did not pay any gold themselves, or propose to pay any, but they wanted me to borrow their notes. I said, 'No, gentlemen, this great American people is worth all of you put together, and I will take the credit of these people and cut it up in the form of little bits of paper, and we will circulate that paper, and we will receive that paper for bonds, upon which we will punctually pay the interest in gold.' And then, in order that the national currency might be permanent, and that nobody could have just cause to complain, I called the national banking system into existence, and pledged every bank to redeem its currency in greenbacks, and the Government pledged that every dollar should be redeemed in the end—the securities to be pledged and provided—that in the end everything should be made equivalent in gold.

"I think this is the true idea of a greenback. It is the credit and property of the American people—made to serve the purpose of money in the midst of a great strife, when we must have everything we can get. And, fellow citizens, in my humble judgment if out of this war this national currency comes as is provided for in our platform, so that no western farmer or merchant will be obliged to pay tribute to the East in his exchange, so that we shall not lose upon exchange so large a profit upon our industry; so that the laborer receives his dollar or two dollars, or dozen dollars, at the night or week's end—shall be perfectly sure that it wont turn to dust and ashes before the morning sun rises; I say if we can get such a sound currency as this, then this country will not at least have been without one of the collateral benefits of this war; if you can take your money on the Atlantic and go to the Pacific, and pay your bills all the way, without having to change the currency at every tavern you stop at.

"I say if the Government is administered as it should be, with proper vigor and economy, every dollar in greenbacks would be as good as a dollar in gold. Why, eight months ago, if I could have had the assurance that I would not have been troubled with any other issues—if I could have been assured that there should be no trouble from any unauthorized currency, unauthorized by any but the nation itself—I would have undertaken to resume specie payment in a week, if anybody wanted it, and I say now, if the war is prosecuted as it ought to be, and the Government is administered with the economy and prudence that I trust it will be, then there is no more danger of that currency than there is that the American people will fail."

An English paper says:—"Rust eats fast into wrought-iron structures. This year no less than 40 tuns of iron rust were taken out of the Menai tubular bridge at one thorough cleaning." At that rate it will soon be carried away in old iron.

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Enormous Casting.

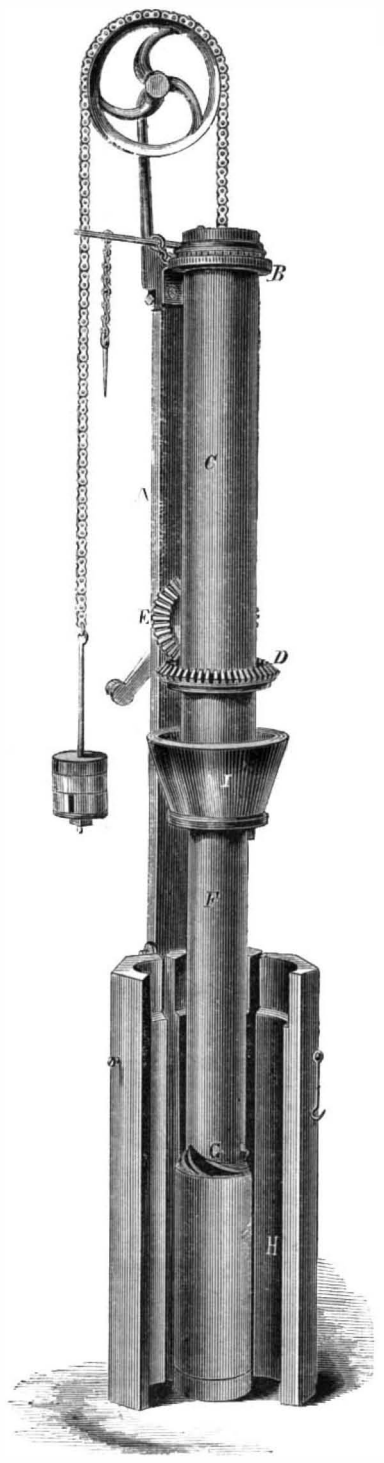
It may be in the recollection of our readers that in July last the *Sheffield Independent* reported a successful attempt made by Messrs. J. M. Stanley & Co., the Midland Works, to cast an anvil block weighing 160 tuns. The enormous mass of iron took six weeks to cool, and it was then, by means of hydraulic power, lifted from the mold. On Friday, the same firm were engaged in casting a second anvil of precisely the same size and weight. The mold, which was 12 feet square at the base and 11 feet 6 inches deep, was dug out in the center of the workshop, and from five furnaces constructed at intervals round the building, the molten iron was run. The first furnace was "tapped" at six o'clock in the morning, and in about twelve hours the mold was filled. The opportunity was embraced by Messrs. Stanley for testing their newly-patented rotary engine. An ordinary engine of 12-horse power was used to drive a portion of the blow fans. It was worked at a pressure of 80 pound, and the fans made 1,400 revolutions per minute. The new engine, which is of 10-horse power, drove fans of the same dimensions, was worked at the pressure of 50 pounds, and the fans made 1,600 revolutions per minute. The new engine worked much easier than the one on the old principle, and consumed about half the quantity of fuel. The expectations of the patentees in regard to the power, compactness and economy of the engine have been fully realized. The enormous castings referred to are intended for the gun manufactory of Messrs. Firth & Sons. For months past men have been engaged preparing for them "beds" of extraordinary solidity; the necessity for which will be apparent when we state that each anvil has to receive the blows of a 25 tun Nasmyth hammer. Extensive alterations are going on in the steel melting department at the works of Messrs. Firth. The building intervening between the steel melting furnaces has been removed, and other furnaces in its room erected. When completed, there will be, in a space of 160 feet long by 60 feet wide, 170 melting pots, and an ingot of steel of from 12 to 14 tuns weight will be turned out at one casting. In the center of this department will be erected a powerful steam crane. This firm will be celebrated for possessing the largest anvils in the world, and the most extensive and complete set of steel melting pots.

Minerals of Ceylon.

Plumbago is the only mineral of importance. In 1860 (an exceptional year in regard to this article), the export rose to 75,660 cwts., from 23,823 cwts. in 1850; but in 1861 it fell to 38,345 cwts., the average of the past seven years being 20,594 cwt.; but the export fluctuates exceedingly. It is generally of a coarse quality, fitted for the lubrication of machinery, and for use in the arts in the shape of crucibles for melting copper and the more precious metals. Some is fine enough to be compressed into parcels, but for this purpose the Ceylon plumbago is greatly inferior to that of the Somerset and Cumberland hills. It is generally found pretty near the surface. In the Western Province a royalty is charged by Government for plumbago digging at 7s. 6d. per tun. In the Southern Province a duty of one-tenth on the value of the article (usually reckoned at £4 per tun) is levied, which is equal to 8s. per tun. These two provinces are the only two in the island which contribute any revenue on account of plumbago. The amount received in 1861 was £383. Although occasionally a blue sapphire or a ruby of some value turns up in the zygnamies or localities worked, plumbago is the only mineral of any commercial importance. There are about forty-two localities where iron-stone is dug for native use. Most of the lime used is procured from coral and shells. The gneiss of Ceylon is seldom used for building purposes, cabook (latirite) being so much easier worked. Sandstone is found on the sea-shore, not far from Colombo. In the Northern Province coral lime-stone is the universal building material, and the roads are made with a species of lime-stone gravel. In other parts of the island the roads are metalled with a species of broken gneiss. Cabook is very common near Colom bo, and is found valuable for building purposes. It is easily cut into blocks, and when well protected from the weather by lime or cement will last a long time. In house-building it is generally used for walls, with brick pillars between for the support of heavy roofs, etc. Cabook is paid for at the rate of 4s. a thousand when cut on crown lands, but little revenue is received from this source, as it is principally obtained on private property.

PARMELEE'S CORE-MAKING MACHINE.

The object of this machine is to form cores, for casting iron pipes, by means of a tube with inclined flange or blade attachments at its lower extremity. This tube and the blade attachments are caused to revolve within a core-box and around a core-spindle, as will be seen from the engraving and this description. The advantages gained are: rapidity of performance, superiority of the work, dispensing with skilled labor, a saving in the cost of core-spindles and in their repairs, and finally, the substitution of steam or water power for hand labor. The annexed engraving represents the machine with a core partly ormed, and the core box parted to expose it to view.



A piece of timber, A, to which the parts are attached, is screwed in a vertical position. The brackets, B, embrace boxes in which the journals of the driving tube, C, revolve. Attached to this tube is a beveled wheel, D, into which a similar wheel, E, gears; the shaft of this wheel passes through the timber, A, and is driven by any usual motor. Secured to the inside of the tube, C, and extending the entire length of it, is a narrow strip of iron which serves to carry the tube, F, the upper end of which is formed to fit and freely slide through it. Attached to the lower extremity of the tube, F, is any desirable number of inclined flanges or blades, G. This tube envelopes the core-spindle, which is placed within the core-box, H. The machine being put in motion, the sand is fed into the hopper, I, and by an adjustable feed arrangement within it, is distributed evenly around the tube, F, and falling into the core-box is carried beneath the inclined blades as they revolve, and by the weight of the tube, F, less the counterbalance, it is compressed firmly around the core-spindle within the core-box. This operation is continued until the blades reach the top of the box, when the core is completed and ready to be taken out and placed in the mold for use. Various sized cores can be made by this machine by making such changes of detachable parts as are required for the purpose.

For further particulars, or for the purchase of rights or machinery, address the inventor, Homer Parmelee, No 1,311 South 4th street, Philadelphia, Pa., by whom it was patented Sept. 4th, 1860.

Preserving Fats.

The British Pharmaceutical Conference commenced its second annual meeting at Bath on the 14th of September last. On the second day a paper was read by T. B. Groves, F. C. S., on the rancidity of fats:—

The author stated that the observation of the preservative effect of aromatic oils on oxide of mercury ointment had induced him to compare the relative efficacy of the various essential oils of commerce, both as regards mixed ointments and the pure fats. After general remarks on the process of rancidification, and the theories that have been imagined to account for it, he proceeded to consider the possibility of applying remedial measures of a radical character, which he decided in the negative. The experiments on variously-prepared specimens of lard, aromatized and non-aromatized, were then detailed, and the conclusion arrived at that creasote, oil of pimento, oil of cloves, and balsam of Peru, were capable of greatly retarding, if not of altogether preventing oxidation. A comparison of the effect of these aromata in preserving these aqueous solutions of albumen, gave countenance to the theory of the cause of rancidity of fats being the disturbance effected by a ferment of the albuminous matter. He concluded by strongly urging the necessity of using for the preparation of ointments, especially those combining metallic oxides, materials retaining unaltered the odorous principles with which nature has endowed them, and suggested the advisability of adding to lard and other inodorous fats small proportions of oil of pimento, to render them more permanent; to effect which, two drops to the ounce had been found sufficient.

The President said that the lard used in pharmacy would not be so troublesome if a little more care was taken in preparing it. The leaf or flare should be cut up, and thoroughly washed with a large quantity of water before rendering the lard from it. The most effective way of washing the flare was to place the pieces on a sieve, and agitate the latter in a vessel of water.

Dr. Parkinson said that he had used the oil of benzoin to preserve ointments with great success.

Mr. Balkwill asked whether there was any way of preventing cod-liver oil from becoming rancid.

Mr. Robbins, in reply to this question, said that the oil did not become rancid when kept in sealed bottles. He had found samples that had been sealed up for two years perfectly sweet. The best way of preserving cod-liver, was to keep it in small bottles securely closed. Dr. Attfield had proved, some time ago, that the change of rancidity was accompanied by absorption of oxygen.

Asiatic Cotton.—If the intelligence brought by the Bombay mail, which reached England in October, is correct, the amount of the East India cotton crop will soon begin to tell upon the price of consumption. There were at sea in the middle of October forty-eight ships, laden with 224,577 bales. One ship is credited with 6,951 bales. We used to consider twelve hundred bales a good cargo, and when three thousand were packed away in Mobile or New Orleans, the feat was thought prodigious. These heavy imports from countries which were wont to raise little more than what sufficed for their own needs, is one of the results of our war, and will tend to lower the cost of cotton cloths.

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Correspondence

Everlasting Wick Wanted.

MESSRS. EDITORS:—I want assistance from some of your inventors to get me out of a difficulty. I am a Coal-oil Burner, and am perpetually in trouble with the nasty Cotton Wicks. When I complain to the wick that it is not throwing up an even flame, it always says that it has not been trimmed right; and when I hear the person who trims the lamp spoken to on the subject, it is generally "Oh, that old burner is about used up, it's not the trimming." Now I beg to assure you that I am not used up at all; give me a good wick and you shall never complain of a bad light. It was only the other day that the wick and I had quite a small row over the matter; the wick jerked the flame out in all directions. We got quite warm on the subject, so much so that snap went the glass; upon which the old gentleman, who was reading, turned down the light and ordered us out of the room; adding, as we were taken out: "Oh, what a smell that nasty lamp has made." This is all very unpleasant to me, and what I want is, some one to invent a perpetual everlasting wick, that shall want no trimming. I would suggest a wick of platinum wire. Cotton would do for the lower part, with half an inch of wire at the point. Or would not two pieces of steel, placed close together, draw up the oil? I hope something better than the nasty cotton thing may soon be invented. I would try and invent a wick myself, but, being a Canadian, I am an outlaw in the inventive world. I may rob everybody and everybody may rob me, unless I pay some $500, and it's not every brass lamp-burner that has exactly that sum to spare.

A CANADIAN LAMP-BURNER.

Nov. 10, 1864.

Lighting Gas by Electricity.

MESSRS. EDITORS:—Allow me to correct an erroneous statement on page 328, of the present volume, viz: "When the Cooper Institute was dedicated, it was *intended to light every burner instantaneously* by electricity at a certain point in Mr. Cooper's address. The time came, but the light did not; and the orator, after pausing for a light in vain, omitted that part of the ceremony." I was present upon the occasion referred to, in the fall of 1859, and recollect that the gas was burning when the proceedings commenced, the season requiring artificial light at that time of the day. At a point in Mr. Cooper's address the light was suddenly turned off entirely, and in a few seconds thereafter relighted instantaneously by galvanic electricity, acting through a "Ruhmkorff" coil, under the charge of Dr. P. F. Vanderweyde (now of Girard College, Philadelphia). This was done to illustrate a portion of Mr. Cooper's discourse, in which he referred to the mighty achievements of science in practical matters. Since then the apparatus has been abandoned, owing to a defect in the fastening of the platina wires, making its operation unreliable. I ask that the above correction be published, to prevent injustice being done to persons connected with the Cooper Union.

GUSTAVUS MILLER.

48 Beekman street, N. Y., Nov. 17, 1864.

[We also were present, and estimated the seconds at not a few. Can you tell us how many they were? EDS.]

A Forty-feet Barometer.

MESSRS. EDITORS:—There is now in process of construction, at this Institute, a barometer, which for size and accuracy of register, is superior to anything ever attempted, and which, if successful, will be well worthy the attention of the scientific world. It is the invention of a gentleman already favorably known as an inventor, and the Temple Grove Institute, at Saratoga Springs, has been selected as the spot in which to make the experiment; because, in addition to the constant observations of the professors connected with the Institute, it can be under the daily observation of the inventor himself. The instrument will be forty feet high; will pass entirely through three stories of the building, and the observations will be made in the large hall in the fourth story. I propose now merely to notice the fact of its contemplated construction, and at some future time will send you a description of the instrument, materials to be used, manner of filling the instrument, range of elevation and depression, and all matters of interest to your scientific readers.

H. F. BEECHER.

Temple Grove Institute, Saratoga Springs, N. Y., November, 1864.

The Fiber of the Hop Vine.

MESSRS. EDITORS:—I discovered, some two years ago, that the common hop vine, the *Humulus Lupulus*, contains in the inner bark, like the hemp, very tough fibers, which in our days of high price of cotton and rags might be turned to useful purposes. No doubt it will answer as a good substitute for rags in the manufacture of paper. It is not so singular that this plant should possess this fiber, when we remember that it belongs to the hemp family, and I would not be surprised if, by looking among the species in the genera of the nettle family (*Urticaceæ*), of which the above is a sub-order, we should find some more fiber-bearing plants.

C. L. LOCHMAN.

Carlisle, Pa., Nov. 7, 1864.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Felting Machine.—This invention consists of important improvements in machines for felting yarn and cloth, and embraces several particulars, one of which is a rubbing surface, which may be extended upon a cylinder, through which steam or hot air can pass and act directly upon the material, the cylinder or frame, meanwhile, having a vibratory motion endwise as well as a continuous rotary motion of the surface, is to be used for felting yarn; it is further prepared by laying wires around the cylinder so that a series of slight grooves or depressions will be formed about it in which the yarns will be retained. The vibration of the cylinder is produced by means of a frictionless cam of peculiar and original construction. Great results are anticipated from this invention. John H. Bloodgood, of New York city, and Moses A. Johnson, of Lowell, Mass., are the inventors. Patents for this valuable invention have also been secured through the Scientific American Patent Agency in foreign countries.

Improved Skate.—This invention relates to a skate with an adjustable toe clamp. The heel clamp consists of a slide provided with a slot to fit over a suitable guide which extends from the heel post, and with a projecting flange on its inner end to catch over the breast of the heel, and with a forked lug applied in combination with a screw provided with a double collar or neck, and screwing into the heel post of the skate in such a manner that the slide can be dropped easily over the guide and screw, and by the action of the screw a positive motion is imparted to it in either direction. The toe clamp consists of two slides moving in a lateral direction, and provided with ratchet teeth to operate in combination with a spring catch, in such a manner that said slides are allowed to close up and to take a firm hold of the edges of the sole, but are prevented from releasing the sole by the spring catch engaging with the ratchet teeth in their under side. R. Tillmann, of 229 William street, New York, is the inventor.

Axle-box for Car Trucks.—The object of this invention is to prevent the heating of the boxes, the delay of trains, to economize in the consumption of oil for lubricating, and to greatly diminish the amount of friction which is produced by the lateral motion of the cars and in turning curves. The invention consists, first, in reducing the end of the axle journal to a pivot or to a size much less than the portion of the journal on which the bearing rests, and thereby reduce the tendency to heat at the point where the axle comes in contact with the spring or check. It consists, second, in the use of a spring placed in the front part of the axle box and at right angles with the journal, and so arranged as to receive the end thrust of the axle and soften or ease the intensity of the blow of the axle arising from a quick lateral motion or side-surging of the cars, thereby reducing the tendency of the journal to heat at its end, and relieving the axle from much strain. It consists, third, in a peculiar stuffing box, constructed and arranged to prevent the admission of dust within the box and the escape of oil therefrom. And, fourthly, it consists in a novel and improved manner of lubricating the journal, whereby the latter may always be properly supplied with oil even when the cars are in motion. William Loughridge, of Weverton, Md., is the inventor.

Machine for forming Articles of Sheet Metal.—This invention relates to an improvement in that class of machines in which the operation of raising sheet-metal is effected by the action of a punch or plunger connected to a piston to which motion is imparted by hydraulic pressure or by steam. The metal blank is placed in the female die and held there by a flanged plate, which, in machines of the ordinary construction, is depressed by lever or screw power. In order to operate this plate one or two extra men are required, and the operation of the whole machine is thereby rendered expensive; and, furthermore, the lever or screw acting on said plate bears on the same at or near one of its edges, and the power required to hold the same down is much larger than it is when applied uniformly to all its corners. To obviate these defects is the object of this present invention, which consists in connecting the plate which holds the blank in the die to a piston which works in a suitable hydraulic or steam cylinder, the convertion between said plate and the piston being effected by means of four rods rising from the four corners of the plate, and secured in the four wings of a cross-head attached to the upper end of the piston rod in such a manner, that by the simple change of the induction valve the plate is depressed or raised with a uniform force on all sides, and that one man can attend to the plunger and to the plate with the greatest ease and convenience. M Wells, of Williamsburgh, N. Y., is the inventor.

Life-Raft.—This invention consists in a novel construction of life-raft, combining buoyancy, strength, great capacity and portability, and which shall ride securely over surf and breakers. The body or case of the raft is made of the best duck, the same being formed in the shape of cylinders, of which there should be three or more. These cylinders receive within them gutta-percha or rubber cylinders, whose capacity for expansion without straining them is to be greater than the diameter of the duck cylinders. It follows, therefore, that the latter will receive all the strain of the inflation when the rubber cylinders are blown up, and the rubber cylinders will neither be likely to become frayed nor to be burst or worn by the pressure of the air within them. The raft is in other respects very ingeniously constructed, and when the air is withdrawn can be stowed in a small space. E. L. Perry, of New York City, is the inventor.

Ginning Cotton.—This invention is chiefly applicable to the machines for ginning cotton known as the Macarthy gins, but it may be applied to other machines for ginning cotton, in which a grooved roller is employed. It has hitherto been customary to make these rollers of wood or iron covered with leather, in which spiral grooves, of three-fourths an inch or more asunder, are cut. This invention consists in making the rollers of cast-iron or other suitable metal, in which fine spiral grooves are cast or cut, the edges and sides of the spiral grooves being more or less serrated, or corrugated, or wrinkled. By this means a greater quantity of cotton may be cleaned in a given time, and the roller is made more durable. William Wanklyn, of Lancaster, England, is the inventor.

OIL OR GAS WELLS IN CHINA.—In the districts of Young Hian and of Meisonug Hian, in China, there exists a large number of salt-water wells extending over a space of about six leagues, which are actively explored by the neighboring population. From the mouth of these wells arise columns of inflammable air, so that if a torch be applied to the opening, globes of fire of from twenty to thirty feet high are seen to arise, shining with a brilliant light. The Chinese arch over these sources of gas with long bamboo tubes, and the gas communicated through these tubes serves to illuminate the machines by which the salt wells, and the places where they are situated, are explored.

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BERDAN'S BREECH-LOADING RIFLE.

Among rifles, Whitworth's has possessed a superiority over all others in range, while Clarke's has taken the lead in accuracy. Clarke's is made by contracting the bore slightly towards the muzzle, making it the smallest at about 2 inches from the end, and then cutting off the barrel at the throat. The piece which is cut off is replaced for loading, being secured in position by dowel pins, and is removed before the gun is fired. The acorn-shaped shot is made of such size that it has to be driven through the false muzzle by means of a short ram-rod having a conical cavity to fit the apex of the shot, so that the base of the shot is swaged into the grooves of the bore, and its axis is made to coincide precisely with the axis of the bore. This device has placed Clarke's rifle at the head of all small arms for accuracy of fire, and secured it so general favor among our riflemen that it has come to be known as the American target rifle.

As the shot in this gun is swaged through the patch, it has to be made of the very softest lead, and this softness of material imposes a limit on the length of the shot. For if the shot be made very long the inertia of so large a mass will cause the pressure of the gases against the base to shorten the shot, and enlarge its diameter so much, that it will press the patch so tightly as to wear it to pieces in the course of its passage out of the gun.

Whitworth overcomes this difficulty by preparing his shot beforehand so that it will exactly fit the grooves of his gun, thus dispensing with the use of a patch. He then makes his shot very long, those of $\frac{44}{100}$ths of an inch in diameter being about $1\frac{1}{2}$ inch in length. This, of course, gives very small resistance of the air in proportion to the weight of the shot; hence his superiority in range. The great length of the shot requires a very rapid rotary motion in order to keep its axis parallel to itself throughout its flight, and the Whitworth gun has one turn in 20 inches. With so short a turn the shot would strip across the grooves if it were made of soft lead; it is consequently necessary to harden it by a mixture of zinc or tin in its composition. As it is not necessary to alter its form by the action of the powder in the gun there is no objection to this hardening.

Colonel Berdan conceived that if he could combine the accuracy of the American target rifle with the long range of Whitworth's and the convenience of breech-loading, he would have a perfect gun, both as a weapon of warfare and as a rifle for sportsmen. The simple plan for accomplishing this was to continue the hexagonal form of the Whitworth bore through the counter bore or cartridge chamber, and then make the cartridge of corresponding form to fit this chamber; thus centering his shot with absolute precision. There were manifest difficulties in the way of rifling the counter bore to correspond with the grooves in the barrel, and the overcoming of these difficulties Colonel Berdan regards as the principal triumph in his invention.

On the 12th inst., there was a trial of Berdan's gun in comparison with the best known English and American rifles. A target 12 feet square, was set up at three-fourths of a mile—less 30 yards. A fixed rest was prepared for the guns with a spring to take up the recoil, and the firing was done by a disinterested expert. The rest was somewhat elevated, and the highest sight on the gun was raised, giving the whole elevation of the gun, we should judge, about 10 degrees. With Berdan's rifle, at this enormous range, 7 shots out of 27 struck the target.

All of the guns were tried for penetration also. Planed boards, one inch in thickness, were nailed together an inch apart, and placed in front of the shooters. The following is a statement of the number of boards penetrated by the shot from each gun:—

Spencer, Government charge	15¼ boards.
Whitworth, 68 grains powder, 540 lead	20
Whitworth, 68 grains powder, 540 lead	23½
Mountstorm breech-loader	15½
Clarke's Patent, 120 grains powder, slow burning	18½
Federal Swiss target, 65 grains powder, 283 lead	15
Starr's carbine, weight 7½ lbs., 21 inches long, breech-loading 60grains powder, 456 lead	16
Sharp'sbreech-loading, Government charge, 456 lead	18
Enfield, 65 grains powder, 500 lead	15½
Enfield, 80 grains powder, 500 lead	15½
W. X. Stevens's breech-loading carbine, weight 7¾ lbs., 30 grains powder, 400 lead	14½
Springfield, 65 grains powder, 500 lead	17½
Springfield, 80 grains powder, 500 lead	15½
Berdan's carbine breech-loading, weight 7 lbs., 90 grains powder, 540lead	26½
Berdan's rifle, weight 10 lbs, same charge	31
Whitworth, 60grains Berdan's powder	26
Whitwo th,Berdan's charge	32

The last shot of the Whitworth was through a part of the target that had become much shattered, still it showed that the great power of penetration attained by Colonel Berdan's rifle was in part to be attributed to the excellent quality of his powder.

A trial was then made with the cartridges prepared for volley firing. These contain 3 spherical balls each. It is stated by experienced army officers that the most efficient charge for infantry is one ball and 3 buckshot in a smooth bore musket. But there are serious objections to this, as the men using it are deprived of the use of rifles for long ranges, and the buck shot are effective at only very short ranges. But the 3 spherical balls of Berdan's rifle combine the range and accuracy of the rifle with the destructiveness of the buck shot charge, and the extent of the scattering can be adjusted at will by varying the windage; with a windage of $\frac{2}{1000}$ths of an inch the spread is about 5 feet in 200 yards

Colonel Berdan has invented a breech-loading arrangement to accompany his improved chamber and cartridge, and we intend soon to give an illustration of it in our columns.

Scotch Steamboats.

The blockade runners are the fastest and best boats built on the Clyde. *Mitchell's Steam Shipping Journal* says:—

"Many of our fast-sailing river steamers have left the Clyde to make, in some cases, a singular succession of fortunate runs; while others—not a few, indeed—have gone out only to become the prey of the blockading squadron, and thereafter to do duty on the waters of the Hudson or the Potomac. Nearly all our best river steamers have disappeared in this way, and were the many fine vessels built specially for this trade added to them, the list would be a surprisingly large one. The building of blockade runners is now, indeed, a regular branch of the work of our shipbuilding yards."

The fastest and latest of these boats are daily caught by our ocean steamers. The *Fort Jackson*, a heavy side wheel steamer, lately caught the *Let Her Rip* in a two hours chase. The *Let Her Rip* was built especially for speed, but in this case did not "rip" quite fast enough.

Cutting up Pork.

Have the hog laid on his back on a stout table. Clean the carcass of the leaf fat. Take off the feet at the ankle joints. Cut the head off close to the shoulders, separate the jowl from the skull, and open the skull lengthwise on the under side, so as to remove the brains fully. Remove the backbone in its whole length, and with a sharp knife cut off the skin—then the fat, leaving only about one-half inch of fat on the spinal column. The middlings or sides are now cut from between the quarters, leaving the shoulders square shaped, and the ham pointed, or it may be rounded to suit your fancy. The ribs are next removed, partially or entirely from the sides. The trimmings of fat from the hams and flabby parts of the sides are rendered up with the backbone strip for lard. The sausage meat is cut from between the leaf fat and the ribs; any other lean pieces are used for the same purpose. The thick part of the backbone that lies between the shoulders is called the chine; it is cut from the tapering bony end, and the latter part called the backbone by way of distinction. The backbones are used while fresh; the chine is better after being smoked.—*Country Gentleman.*

STARCH SUGAR has been converted into a sweet, hard, granular condition, in which it resembles ordinary sugars, by Mr. F. Anthon. He first treats the starch with sulphuric acid in the usual manner. The neutralized solution is then evaporated in a wooden vessel, allowed to rest and to solidity gradually. The mass of raw sugar is then removed and strongly pressed in a cloth, the sirup which is pressed out being reserved and boiled down in a fresh operation. After pressing, the sugar is melted and further concentrated in a water bath until the liquor reaches 43° or 35° Baume. When this point is arrived at, the melted sugar is allowed to cool, with an occasional stirring. If it is desired to obtain the sugar in small granules, the stirring is continued. When this mass has cooled to 25° or 30° Reaum., it is removed and dried in a gently heated drying-room.—*Technologist.*

Curious Application of Heat.

It is well known that the air confined under glass, if it receive the direct rays of the sun, will become much heated, far beyond the temperature of the rays owing to the action of the glass in absorbing these rays and conveying the absorbed heat to the air within. Prof. Mouchot, of Alençon, has made the following application of the heat thus acquired. He takes a bell of silver, very thin and covered with lamp-black, and places over it two bells of glass, and exposes the whole to the rays of the sun. Two curved tubes furnished with stop-cocks pass under the black bell, one of them to supply water when it is required, the other to give exit to the water; the latter terminating outside in an ordinary *jet d'eau* orifice. Being now exposed to the solar rays—whose heat is transformed into non-luminous heat in its passage through the walls of the bells, an effect that goes on accumulating without cessation—the air situated above the water dilates, and by its pressure causes a jet to rise attaining sometimes in Mouchot's trials a hight of nearly 33 feet. When the water is exhausted a screen placed before the sun will cool the interior and cause the water to return, or a new supply may be introduced through the supply-pipe. Many times the shade thrown over the apparatus by spectators caused it to stop, much to their surprise.—*Les Mondes.*

Fire-escape Patent--Heavy Verdict.

George B. Mickle, of this city, brought an action against the Corporation of the city of New York to recover the sum of twenty thousand dollars and interest from Nov. 10th, 1860, on account of a purchase from the plaintiff, by the city, of a patent fire-escape and hook and ladder apparatus. The plaintiffs proved the passage of two distinct resolutions by the Common Council in 1860, appropriating the above amount, and both of which received a three-fourths vote of both boards; also the passage of another resolution requiring the Street Commissioner to advertise bids for applying the plaintiff's improvement on one of the city trucks; also the advertisements made and proposals issued by the Street Commissioner. The plaintiffs further proved that they had demanded payment of Comptrollers Haws and Brennan, and the tender of the assignment of the patent right to the city, and that payment was refused, and the assignment not received. The defense was that the Common Council had no right to make a contract for the purchase of the patent, and that there has been no money in the city treasury since 1860 to meet the appropriations passed on the subject. The jury, under the instructions of the court, rendered their verdict for the plaintiff for the sum of $25,632 23.

Diamonds in Australia.

The *Technologist* says:—"If any doubt existed on the subject of Australia being a diamond-producing country, it is now removed. A successful digger, named Williams, from the Yackandandah district, submitted to Mr. Crisp, jeweller, Queen street, a collection of small stones which he had picked up while washing out gold. Amongst these was a diamond, the largest yet found in the colony, so far as is known, and of purest water. Its natural facets are perfect; its color is a pale green, but approaching much more nearly to the pure water of the East Indian diamond than the stone which was the subject of a conversation not long ago in the Legislative Assembly. It weighs $2\frac{3}{4}$ 1·32 carats, or nearly three carats, and was found at Wooragdy, near the Magpie, Yackandandah, in auriferous eartn taken, about four feet deep, from a hill-side."

Temperature of the Sexes.

The theory of Aristotle that a man possessed more warmth than a woman, had been disputed; and it had been held by some, as the result of modern research, that the temperature of women was slightly superior to that of men. Taking the average, the temperature of males and females was as 10·58 to 10·13. The result of some elaborate experiments recently instituted was that the temperature in the case of the men varied between 99 and $99\frac{1}{2}$, that of the women was between $97\frac{3}{4}$ and 98. An examination of other animals gave still a somewhat higher temperature for the male than the female, six fowls showing the proportion of 108·33 for the former to 107·79 for the latter.—*Proc. Brit. Assoc.*

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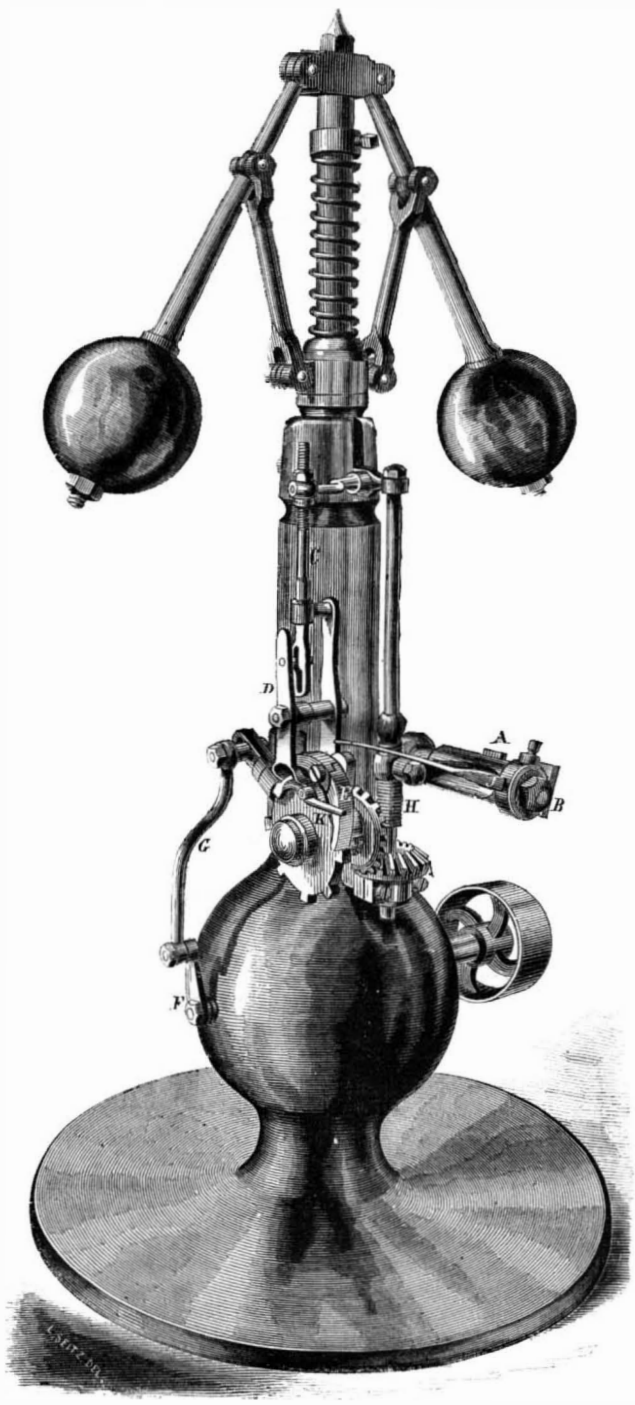
Improved Governor.

This governor is designed to regulate steam engines, having cut-off motions attached, as in the Corliss or other engines of any kind, including engines that are regulated directly by the main valves.

"The object of this governor," say the inventors, "is to obviate the violent changes and consequent fluctuations in the quantity of steam admitted to the piston by ordinary governors. This improvement is to admit the right quantity of steam to the cylinder so that the balls will assume one position, let the resistance be what it may; consequently the governor has a more perfect action and the engine a steadier speed than with common governors. The toes, A, on the rock shaft, B, to the right, bear on the cut-off levers and depress them so as to cause them to take greater or less hold on the valve levers of the engine, and thereby remain longer in connection with them, opening the valves to a corresponding greater degree. The ordinary governor gives speed to the engine, corresponding in some degree with the quantity of steam admitted into the cylinder, and the variable resistance, power or labor of the engine; consequently the speed of the engine is fluctuating, arising from the balls being rigidly connected with the cut-off motion or main valves. When the balls on the governor fall, they lower the rod, C, which has a slot in it of peculiar shape. This slotted rod acts on the lever, D, through a pin placed therein, and throws one of the pawls, E, into connection with the ratchet wheel. These pawls are always rocking back and forth, being driven by the crank, F, and the rod, G. When either of the pawls are thrown into contact with the wheel, the screw shaft, H, is turned by the gears, L, which causes the main rock-shaft toes to be elevated or depressed, as the case may be, thus increasing or diminishing the amount of steam let on to the piston of the engine. When the engine is running at its regular speed, the slotted rod, C, remains in the cross, of the slot or a point of no motion, but the least variation in the speed causes the slotted rod to rise or fall, and thus to act on the pawls which rotate the screw shaft, H, through the gear and ratchet wheel. When the engine stops the arm, J, on the rock shaft comes in contact, as the balls fall, with the arm, K, on the lower part of the lever. This arm, K, is part of a shoe which, being operated on by the arm, J, places the pawls in such a position that they will not touch the ratchet wheel. By this provision the escapement motion stops, and the screw rod cease to turn, and also at times when the engine is overloaded and the valves opened to their full extent. This improved escapement governor is self-adjusting and needs no particular attention from the engineer. The speed of the engine is easily regulated by this governor. It is only necessary to raise or lower the slotted rod, C, to make the engine run fast or slow, whereas, in the common two-ball governor the size of the driving pulley must be increased or diminished to effect the same object.



KELLY AND LAMB'S GOVERNOR.

"This governor has been running in a cotton mill in Forestdale, R. I., for some months, and its action has been found to be a great improvement in regulating machinery, especially on cotton or woolen looms."

A patent is now pending on this governor through the Scientific American Patent Agency, by Oliver A. Kelly and Estus Lamb. For further information address them at Slaterville, R. I.

JUDGMENT AGAINST THE "GREAT EASTERN" IN FAVOR OF MR. TOWLE.

It will be remembered that the *Great Eastern* steamship, in September 1861, when two days out from Liverpool on her way to New York, met with a violent gale, in the midst of which her rudder post twisted off, leaving her at the mercy of the waves, and that after floundering in the trough of the sea for two days, a steering apparatus was devised by one of the passengers, Mr. Hamilton E. Towle, an American civil engineer, by which the great ship was rescued from her perilous situation. A narrative of the affair with an illustration of the apparatus was published on page 263, Vol. V, Scientific American. The owners of the *Great Eastern* refusing to recognise in any way Mr. Towle's services, he commenced an action for salvage in the United States District Court, and attached the ship while she was in this harbor. The case was decided on the 12th inst., in favor of Mr. Towle. The decision rendered by Judge Shipman was an elaborate discussion of the law of salvage, concluding as follows:—

"The authorities cited show that officers and crew, pilots and passengers may all become salvors when they perform services to the ship in distress, beyond the line of their duty. The duties of passengers are much more circumscribed than those of sailors or pilots; and it would seem that all the law imposes upon them is to assist in the ordinary manual labor of working and pumping the ship, under the direction of those in command of her. If they assume extraordinary responsibilities, and devise original and independent means by which the ship is saved, after her officers have proved themselves powerless, I see no reason, and know of no authority that can prohibit them from being considered as salvors. I think it follows, from the principles laid down by the authorities,

"1. That a passenger on board ship can render salvage service to that ship when in distress at sea.

"2. That in order to do this he need not be first personally disconnected from the ship; but,

"3. That these services, in order to constitute him a salvor, must be of an extraordinary character and beyond the line of his duty, and not mere ordinary services, such as pumping and aiding in working the ship by usual and well-known means.

"That the services of the libellant in the present case were of an unusual character cannot be denied. After the officers of the ship had exhausted their means of getting control of the rudder, he devised, and with the aid of a large number of men put under his directions by the captain, executed a plan which, in the judgment of this court, was the efficient means of rescuing this great vessel from peril. The whole work of accomplishing this result was entrusted to him and to his directions. If it is said that he got his main idea of the plan he carried out, from witnessing an experiment of the engineer, which, I doubt, still the effort of that officer had entirely failed and was an abandoned experiment. The merit of the libellant in overcoming the obstacles which had proved insurmountable to the engineer, is, in my judgment, enhanced rather than diminished by the unsuccessful effort of the latter. That the service rendered by the libellant was a very difficult one, is proved by the fact that the able and experienced officers of this ship had failed to accomplish the result which he finally secured. They had spent two days of fruitless effort, though stimulated by motives as powerful as can be addressed to the minds of men. It required no little moral courage for this libellant to interpose to arrest the unscrewing of the nut on the rudder-shaft, and then assume the responsibility of a new and different experiment, which would consume precious time, and might thus produce appalling consequences. Had he failed, the consequences to him would have been injurious and humiliating. The whole circumstances of the case are so extraordinary as to leave no doubt in my mind that the services which he performed were wholly beyond his duty as a passenger, and therefore entitle him to salvage compensation.

"In fixing the amount of compensation, it must be considered that, though the service was one of conspicuous merit and the amount of property saved large, yet the personal danger encountered by the libellant was not very great; and the only things contributed by him were personal skill and labor. He supplied no materials and risked no property, though his labors were protracted and exhausting. On the other hand, he rescued the ship from great peril by his own ingenuity, courage and skill. That the peril of the ship was great, and her position critical in the judgment of her commander, is evident from the fact that he entrusted to this stranger a work upon the success of which her salvation depended, and which for nearly two days had utterly baffled him and his engineers. The case is so novel a one, in all its leading features, that little light can be derived from precedents to guide me in fixing the amount to be awarded; but I have concluded, on the whole, to allow fifteen thousand dollars. Let a decree be entered for the libellant for that amount with costs."

As the agents of the ship were obliged to give bonds before she was allowed to leave the harbor, Mr. Towle will probably have no difficulty in collecting his $15,000.

At Fort Gaines, Mobile Bay, a saw-mill has been put in operation, and everything gives evidence of a people who have come to stay. Under the direction of the Engineer Corps all the damage done these forts has been repaired, and they are to-day stronger than when the fleet passed them.

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Contents:

(Illustrations are indicated by an asterisk.)

*Improved Bronzing Machine 337
On an Ancient Factory of Flint Implements 337
How to Make Apple-Butter 338
African Oil Seeds 338
The Saddlery and Harness Trade Helped by the War 338
Trifles 338
Water Supply of London 338
New Steamship Company 338
Miscellaneous Summary 339
Explosion of a Gunboat Boiler 339
Fine American Tools 339
The School of Mines in Columbia College 339
Special Notices 339
Boring Artesian Wells 340
A Petrified Bee-tree 340
Telegraphing by Magneto-Electric Machines 340
Our National Currency 340
Enormous Casting 341
Minerals of Ceylon 341
*Parmelee's Core-making Machine 341
Preserving Fats 341
Asiatic Cotton 341
Everlasting Wick Wanted 342
Lighting Gas by Electricity 342
A Forty-feet Barometer 342
The Fiber of the Hop Vine 342
Recent American Patents 342
Berdan's Breech-loading Rifle 343
Scotch Steamboats 343
Cutting up Pork 343
Curious Application of Heat 343
Fire-escape Patent — Heavy Verdict 343
Diamonds in Australia 343
Temperature of the Sexes 343
*Kelly and Lamb's Governor 344
Judgment against the *Great Eastern* in favor of Mr. Towle 344
Extension of Patents—for whose Benefit Granted 345
The Value of an Idea 345
American Thread 345
The Way to Foretell the Weather 345
Failure of an English Iron-clad 345
Electro-plating by Magneto-electric Machines 345
False Reports of the *Dictator* 346
Melting Wrought-iron by Electricity 346
Patent Claims....346, 347, 348, 349
Notes and Queries 350
*Penney's Adjustable Wrench 352
*New Boot-drawer and Pantaloon's Guard 352
Charcoal having the Solidity of Mineral Coal formed under Pressure 352
Swiss Passenger Cars 352

EXTENSION OF PATENTS—FOR WHOSE BENEFIT THEY ARE GRANTED.

There seems to be an impression among inventors that since the law of March 4, 1861, went into force, the previous law, in respect to extending patents for seven years, was abrogated. This is not so in regard to cases which were patented under the old law. Any patent which was granted prior to March 4, 1861, may be extended for seven years on proper application to the Patent Office, provided the patentee has not already been amply remunerated for his invention, and proves to the satisfaction of the Commissioner that he has used proper diligence in attempting to realize gains from his patent. The patentees of 1851 should lose no time in making out a statement of their profits and losses in consequence of their patents, and in seeing counsel in regard to an extension, if they wish the term of these expiring patents continued for another seven years.

It is often the case that the extended term of a patent produces to the patentee a ten-fold profit over the amount realized during the first fourteen years of its existence. The assignees of a patent cannot obtain this extension; it must be done at the instance of the inventor—or, if deceased, his heirs may apply for the extension, but in either case ninety days' notice of their intention should be given—for whose sole benefit it is granted.

For full particulars concerning extension, address

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37 Park Row, New York.

THE VALUE OF AN IDEA.

"A penny for your thoughts," says the old saw, and the valuation was doubtless full compensation for those that occupied some men's minds. But thoughts are worth more than a penny now-a-days, and the ideas which are suggested by thought represent millions. The man who got the idea of a clothes-wringer made money; Wilson, of the sewing-machine which bears his name; Horace Thayer, who makes the blacking boxes with wooden bottoms; the inventor of the swinging cigar-lighter, which we see in every store; all these can bear testimony to the value of ideas, as connected with articles in daily use, relating to the improvement or entire supercession of them by better ones. No one should be deterred from putting his ideas into some tangible shape, from the supposition that the field of invention has been exhausted. "My sons," said a dying farmer, "there is a treasure hidden in our fields, set to and dig for it." Thereafter they dug, but found no gold; instead, upon the year ensuing, the fields that had been so thoroughly upheaved returned a thousand fold the seed which had been sown. It is thus with ideas—thought breeds them—and from them may spring the one golden beam which all men seek. Some men's ideas run upon perpetual motion; these are idle dreamers, seeking to accomplish what the laws of nature forbid; but others, more practical, turn their attention to the arts, to the sciences, and to real progress. These are they who shall win rewards. Not pence, but pounds; not shillings, but dollars, attest in hundreds of instances the value of an idea as applied to the improvements in the arts.

AMERICAN THREAD.

Before the war English spool cotton almost monopolized the market for that class of goods. Coates's cable cotton was in universal demand, and gave general satisfaction. With the derangement of the currency and increased rates of exchange, however, its price speedily ran up to four times its old rates, and a fair field was opened for American manufacturers to compete. This they have done satisfactorily, and those who are familiar with the trade, as well as with the testimony of consumers, know there are no foreign threads superior to those made by such concerns as the Willimantic Linen Company, Messrs. Green & Daniels, Merrick's, Shaker, Perry's "Water Twist," Walter's "Circassian," etc. The "Willimantic Linen" thread, in particular, is remarkable for its regular size, hardness, smoothness, freedom from knots, and rotundity. It is in all respects equal to the finest English cotton imported. It runs in sewing-machines as well as silk twist, and has the additional merit of cheapness, it being sold at 12 cents per spool. With the other goods of other firms alluded to we are not so familiar, but have heard them highly spoken of, particularly that of Messrs. Green & Daniels. The "Shaker" thread has a notice on the end of each spool suggestive of the principles of the community whose name it bears. This notice runs, "honest measure on every spool;" and a dealer assured us that there was more likely to be 205 yards than an inch less than an even number.

Other articles in daily demand have been strikingly increased since the war broke out, and it is a question whether, beyond the loss of kindred and friends in the strife, we are not better off in all that relates to advancement than when we had the incubus of the South to carry on our shoulders.

THE WAY TO FORETELL THE WEATHER.

A correspondent requests us to inform him if there is anything that will indicate changes in the weather better than a barometer.

We have in our office a good barometer which we have watched for several years, and we do not consider it as good an indicator of wet or fair weather as the weather-vane. In this region a southeast wind is almost certain to bring a rain within 12 hours, while a northwest wind always brings fair weather in the course of 2 or 3 hours. A northeast wind is generally accompanied by rain or snow, but not always; we have known the wind to blow from the northeast for several days in succession, and the sky to continue perfectly clear all the time. With a southwest wind the weather is wholly uncertain, though more likely to be clear than rainy. For the coming of a northeast storm the telegraph is the most trustworthy of all indications. Dr. Franklin observed that these storms always commence at the southwest, and travel against the wind. They are several hours in coming from Washington to New York, and we are surprised that our shipping merchants do not arrange to have the commencement of a northeast storm at any place lying to the southwest of this always telegraphed to New York and Boston, and promptly made known to the shipping interest in these cities. A sudden fall of the barometer is generally followed by a high wind, but the indications of this instrument in regard to fair or foul weather are very uncertain.

FAILURE OF AN ENGLISH IRON-CLAD.

Our English friends seem to be in an unenviable state of uncertainty concerning the best system for iron-clad ships of war. No sooner do they build than they tear down, and the work of alteration is continually going forward. The *Royal Sovereign*, Capt. Cole's turret ship, is laid up in ordinary, and the last English mails bring intelligence that the *Warrior*, the sometime "model" iron-clad, has been put in dock and dismantled, for the purpose, says the London *Post*, Palmerston's organ, "of making extensive alterations." The same authority also says:—

"The announcement that the *Warrior* has within the present week been taken into Portsmouth harbor, previous to being paid off and dismantled, will probably excite no little astonishment. It is true this step was resolved upon by the Admiralty some time since; but as comparatively few of the public are, as the Americans say, 'posted' in naval matters, the intimation that the *Warrior* has ceased to be an effective vessel of war at the disposal of the government must occasion considerable surprise. The ways of the Admiralty are so thoroughly inscrutable that we will not attempt to divine the reasons that have prompted it to order a ship to be dismantled which was generally supposed to be one of the most efficient in the service. The reasons are doubtless weighty, and we will assume that the course now taken is that most conducive to the interests of the public service. But the fact that a vessel built at an enormous cost, almost new, and which has never up to the present done any service which could not have been just as well performed by the oldest tub in her Majesty's dockyards, is on the point of being dismantled, is one which cannot fail to excite comment. We are new to the art of building armor-plated vessels, and proficiency in it, as in all others, must be dearly purchased. But costly experiments should be closely watched, and no department of the State indulges in costlier ones than the Admiralty. The sums annually voted for the navy estimates are immense; yet, nevertheless, we always seem to be engaged in the reconstruction of our fleets. Vessels are built at an enormous expense, sent to sea for a few months, then docked, then dismantled, and then built over again. If any particular case is isolated from the others, it may be easy to demonstrate that the course taken by the Admiralty is unexceptionable, but one is nevertheless induced to question whether so many costly failures cannot be avoided. We cannot lag behind in the terrible race of competition which is forced upon us by other States."

It is rather costly to build an iron-clad fleet by experimenting, but as the English Lords of the Admiralty do not earn the money they spend, it probably makes no difference to them. Our experiments in this line have taken the form of practical operations, and the *Atlanta*, the *Tennessee* and the *Merrimac* can testify to our prowess. There is not an American monitor laid up to-day, and not one that cannot go anywhere under fire that would sink a broadside iron-clad in five minutes.

Electro-plating by Magneto-Electric Machines.

In our last issue it was stated, on authority of Mr. L. L. Smith, that he had abandoned the use of magneto-electric machines for electro-plating, and resumed the use of batteries. Mr. Beardslee, of College Point, informs us that he continues the use of the machines referred to, and considers the cost of steam power for these machines less than that of acids and metals for batteries to do the same work.

SILLIMAN'S JOURNAL.—The November number of this old magazine fully maintains the high character of the publication, and at the same time exhibits, perhaps, on the part of the publishers, a disposition to give the articles a somewhat wider popular interest. Professor Ogden N. Rood, of Columbia College, contributes a profusely illustrated paper on photographs of the electric spark; Pliny Earle Chase, of Philadelphia, continues his profound but remarkably lucid discussions of barometric fluctuations; there is a long biographical notice of Heinrich Rose, and the usual variety of scientific intelligence and discussion. The work continues to be published by B. Silliman & B. Silliman Jr., at New Haven, Conn.

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FALSE REPORTS OF THE "DICTATOR."

The trial of a new monitor, or vessel embodying the peculiar principles of its construction, is, by a portion of the press, made the occasion for general and total condemnation of it. These reports have two remarkable features: first, their malignity; second, their utter falsity; and the tone of them shows the writers to be prompted by the basest motives. The completion of the *Dictator*, No. 2, and her partial trial show her to be a perfect success; in fact, one of the greatest mechanical triumphs of the day; yet, in the face of this fact, some of the daily papers have allowed incompetent persons to express their "opinions" concerning her. Those who are familiar with the principles upon which the monitors are built need no refutation of the slander, but there are others to whom a letter from the distinguished inventor, Capt. Ericsson, will prove interesting. This letter recently appeared in the Daily *Times*, and says:—

"I beg to assure you that there are no grounds for the apprehension you express in your columns to-day with reference to the *Dictator*. The various statements published about the draft of this vessel are all incorrect. I avail myself of this opportunity to inform those who take an interest in the matter that there has been no guess work or miscalculation about the draft of water of the ocean monitors. The *Dictator* drew, after the launch, half an inch less than estimated, while the *Puritan's* draft was within a quarter of an inch of the estimate. I need hardly observe that the weight to be put on board, after the launch, was known almost to a pound, and, therefore, ultimate disappointment respecting the draft out of question.

"The draft of the *Dictator*, No. 2, published through the Boston journals, was 31 inches at the stern and 43 inches at the bow. In corroboration of the accuracy of those dimensions, it may be stated that the superintending engineer reported that the ship, on the 8th, was 30 inches out at the stern and 43½ inches out at the bow, showing a depression of $\frac{7}{16}$ths of an inch compared with the draft on the 2d. The cause of the discrepancy is obvious, the ship being under completion. Yesterday and the day before the *Dictator* received an additional 215,000 pounds of coal, beside stores, equipment and crew. Accordingly, the superintending engineer reports that this morning, while at anchor in the bay, the ship was 26 inches out at the stern, 37 inches out at the bow, and 19½ inches out of water amidships.

"When the *Dictator* was planned, it was assumed, that keeping the side armor 18 inches out of water, amidships, would effectually protect the hull of the vessel against an enemy's shot during moderate rolling. Experience has shown that the maximum projection of the side armor above water, amidships, should be 16 inches, and that the fighting trim may, with propriety, be reduced to 12 inches, bow and stern being in that case two feet out. To bring the *Dictator* to the former immersion will require 220,000 pounds, the latter requiring 468,000 pounds in addition to the weight on board the ship this day.

"In considering the proper immersion or fighting trim of an iron-clad, which, like the *Dictator*, is intended to meet foreign iron-clads at sea, it will be well to bear in mind the recent improvement of naval ordnance in Europe It is no longer 68-pounders that will be encountered, but projectiles that will put the side-armor of the *Dictator*, heavy as it is, to a severe trial. It will be well, therefore, to keep this side-armor well under water, more particularly since rolling, to a certain extent, must always be looked for. The great buoyancy of the *Dictator* at her present draft, viz., 62,000 pounds to the inch, is an important feature connected with the question of immersion.

"The supposition that the rudder of the *Dictator* had been damaged in launching the ship is quite erroneous. Nor is the published statement correct that the steering-gear is incomplete and out of order. The mechanism applied for working the rudder of this ship is considered by those best qualified to judge the most complete in the naval service. Under direction of the Navy Department, three distinct steering machines have been erected; one outside the turret, one within the pilot house, and a third placed on the berth-deck, under the turret. Each machine, or apparatus, operates by itself, but so arranged that the three may he worked together. The rudder has two tillers, independent of each other, one above and the other below deck. The upper one is actuated by a chain on deck; the lower one by a wire rope, suspended under the deck beams. The trouble experienced with the rudder is simply this, that while the ship was aground at the Navy-Yard sand washed into the step in which works the pivot on which the rudder turns. It will be proper to observe, that when the *Dictator* was taken from the Delamater works to the Navy-Yard, two men could work the rudder—a positive proof that no damage was received during launching. Commodore Rodgers, I am informed, intends to run his ship at a slow rate in the bay, until the sand is crushed and washed out of the step, and the pivot made to work free. The run to-day, it appears, caused the ship to work with considerably greater ease than yesterday. It is to be hoped that the naval reporters will not imagine that the Commodore is trying for speed while he is merely engaged in putting his rudders in proper working order.

"New York, Nov. 12, 1864."

MELTING WROUGHT IRON BY ELECTRICITY.

By invitation of Professor Ogden Doremus, a few days ago we went into the Free Academy to see the great galvanic battery which he uses to illustrate his lectures on electricity. The cups hold one gallon each, and at the time of our visit 360 of them were filled and in operation. Standing in close rows, they nearly cover the floor of a long room. The conductors from the ends are copper ribbons an inch and a half in width, and they are led through holes in the wall into the lecture room.

This enormous battery enables Professor Doremus to exhibit the various effects of galvanism to his classes on the greatest scale. The light produced by the carbon points is far in excess of that resulting from the heating of lime by the oxyhydrogen blowpipe. This is demonstrated by employing the two in the solar microscope. By this electric light crystals of uric acid not larger than the head of a small pin are magnified to the size of ten feet, with perfect definition of outline and structure.

Among the effects of the battery which Professor Doremus exhibited was the decomposition of potash by the current. To direct the current into the cup of potash the pole was terminated by a wrought iron rod about the size of a lead pencil, and in the course of a few seconds the end of this rod was melted, a drop slowly gathering and finally dropping off, when it scattered in a hundred sparks.

A common class experiment with this battery is the volatilization of gold. A quarter of eagle gold piece is placed on a carbon support and the current directed upon it, when the gold rises as a yellow vapor. If a silver cup is held over it, the cup is gilded by the deposit of the golden fumes.

The other apparatus in the Free Academy is on the same large and costly scale as the galvanic battery; the most talented and brilliant lecturers are employed; and all these advantages are free to every child in the city who is gratified to profit by them.

"Thou my country, thou shalt never fall,
Save with thy children—thy maternal care,
Thy lavish love, thy blessings showered on all—
These are thy fetters. Seas and stormy air
Are the wide barrier of thy borders, where
Amid thy gallant sons that guard thee well
Thou laughest at enemies. Who shall then declare
The date of thy deep founded strength, or tell
How happy in thy lap the sons of men shall dwell."

Back Numbers and Volumes of the "Scientific American."

VOLUMES III., IV., VII., AND X., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $2 25 per volume, by mail, $3—which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding VOLS. I., II., V., VI. and VIII. are out of print and cannot be supplied.

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ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING NOVEMBER 15, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

45,007.—Apparatus for Purifying Mineral Oils.—Wm. Adamson, of Philadelphia, Pa.:

I claim the mode herein described of purifying mineral oils, that is to say, mixing the oil with acids or alkalies and washing the mixture with water in a tank or reservoir, by means of a paddle-wheel acting on the contents of the tank, in the manner described.

45,008.—Manufacture of Cast-steel.—Daniel M. Adee, of New York City:

I claim, first, The use of antimony in the manufacture of cast-steel.

Second, The use of lime in the manufacture of cast-steel, substantially in the manner described.

Third, The use of the composition hereinbefore specified, and made of the ingredients above set forth, for the purpose described.

[This invention relates to a composition of the principal ingredients, of which are antimony or lime with franklinite or charcoal, and which when brought in contact with wrought iron, and melted with the same in a crucible, produces cast-steel of superior quality.]

45,009.—Bayonets.—F. W. Alexander, of Baltimore, Md.:

I claim the application of the principle of the saw to a bayonet; in other words supplying to each gun a saw as well as a lance or sword, whether the saw bayonet be constructed precisely like the shape in the drawings appended, or in a modified form.

45,010.—Pressure Gauges.—Alexander Allen, of Perth, Scotland:

I claim the pressure gauge as composed of the siphon tube, G, the non-transparent vessel, A, and the transparent glass tube, D, or its equivalent, arranged and connected substantially as described.

I also claim the means of fixing the glass tube in place with tight joints at its ends, the same being effected by the tubular screw nut, e, the female screw, f, co-operating washers, b and c, and the extension, B', the whole being arranged substantially as hereinbefore described.

45,011.—Sheep Racks.—Amos Allerton, of Aztalan, Wis.:

I claim the special construction and arrangement of the adjustable doors or covers, K K, crib, I, with the inclined floor, J, in combination with the racks, E E, grain troughs, D D, and guards, when used conjointly, so that the grain troughs are between the guards and racks, with the hay cribs inside, as and for the purpose set forth.

45,012.—Faucets.—Alexander Bain, of New York City:

I claim the yoke or lever, c, applied below the plug of the cock or faucet, in the manner specified, so that the liquid may be drawn by pressing the said yoke or lever by the vessel to receive the liquid, as specified.

45,013.—Apparatus for Drawing Liquids.—Alexander Bain, of New York City:

I claim, first, A pipe connected with the lower part of a vessel containing the liquid to be drawn, and rising above the level of such liquid to retain the same, and fitted so that said pipe can be turned down below the level of said liquid for its delivery, as specified, thereby dispensing with the cocks or faucets heretofore employed for stopping the delivery of liquid, as set forth.

Second, I claim the sleeve, f, fitted as specified, to make a water-tight joint at the place where the discharging pipe passes through the thimble or stationary pipe, e, as set forth.

Third, I claim the step or platform, i, and parallel motion bar, k, in combination with the pipe, d, as and for the purposes specified.

45,014.—Locks.—Halsey H. Baker, of New Market, N. J.:

I claim, first, The combination of the bar, B, with the catches, E and the double-acting tumbler, I', substantially as and for the purpose set forth.

Second, The combination of the bar, B, and cam, L, with the recesses, M and N, of the projection, C, substantially as and for the purpose set forth.

Third, The combination of the plate, I, and its projections, with the recess, M, and the bar, B, substantially as and for the purpose set forth.

Fourth, The combination of the bolt, Q, and the catches, R and S, substantially as and for the purpose set forth.

Fifth, The combination of the small locks, G and H, one or both, with the catches, E', substantially as and for the purpose set forth.

Sixth, The combination of the flanges, J' and K', with the lock plates, A, and the bar, B, substantially as and for the purpose set forth.

45,015.—Flaring Metal Hoops.—Henry D. Barnes, of New Haven, Conn.:

I claim giving to a metal hoop the requisite flare, by rolling upon its edges, substantially as and for the purpose set forth.

45,016.—Sash Fastening.—Fordyce Beals and C. T. Grilley of New Haven, Conn.:

I claim the bolt, C, and spring, D, in combination with the plates, E F, the latter being provided with the V-shaped slot, g, and the former provided with the pin, h, passing through said slot, g, all arranged substantially as and for the purpose herein set forth.

[This invention relates to a new and improved fastening for window sashes, designed more especially for car sashes, in order to hold or retain them at different hights. The object of this invention is to obtain a sash fastening which will be simple in construction, not be liable to get out of repair, and be capable of being operated without any special manipulation apart from the simple raising of the sash.]

45,017.—Felting Machines.—John H. Bloodgood, of New York City, and Moses A. Johnson, of Lowell, Mass.:

First, We claim the use in machines for felting of a rubbing cylinder, whose surface is so constituted that steam or hot air may readily pass through the same, from within or without, and act directly upon the material to be felted, whether said cylinder be used in combination with an endless apron, as herein described, or any other opposing surface.

Second, We claim in machines for felting, the use of a vibrating, rotating cylinder, heated from within by steam, hot air, gas or other means, substantially as and for the purposes described.

Third, We also claim covering the rotating, vibrating cylinder of felting machines with wire cloth, substantially as and for the purposes above set forth.

Fourth, We also claim the combination of the cam herein described, with the felting cylinder, for the purpose of giving the rapid vibratory motion to the latter.

Fifth, We also claim the wire guides, R R, shown in Figs. 4 and 5, the object of which is to form suitable channels for guiding the yarns, substantially as described.

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Sixth, We further claim the use of drums heated by steam or hot air, as the carrying rolls of the endless aprons in felting machines, substantially as described.

45,018.—Device for Operating Center Boards.—J. Nelson Buell, of Middletown, Conn.:

I claim the movable part, M, arranged to operate in combination with the lifting rod, D, or its equivalent, and with the removable support, G, on or near the deck of a vessel, substantially in the manner and for the purpose herein set forth.

45,019.—Cultivators.—John M. Burke, of Danville, N. Y.:

I claim, first, The shovel, E, having a narrow central fin, c, and staples, e e, formed on its inner or under surface in the manner described and for the purpose set forth.

Second, The teeth, J, with cutting hooks, i, and concave ends, p, in the manner and for the purpose described.

Third, The arrangement of the shovel, E c f, wings, G G, side beams, B B, handles, D D, cross beam, C, main beam, A, and teeth, J i p, the whole constructing an improved cultivator, substantially as and for the purpose set forth.

45,020.—Tompion Cap for the Muzzles of Ordnance Exhausted of Air.—J. F. Cleu, of New York City:

I claim the combination of the muzzle cap, A, of india-rubber, and the tompion, B, of wood or other stiff material (partially or wholly divided by radial cuts, i i), the whole being applied to the muzzle of a piece of ordnance, substantially as and for the purpose herein set forth.

45,021.—Projectiles for Firearms.—J. F. Cleu, of New York City. Ante-dated Nov. 6, 1864:

I claim, first, The reduction of the size of an elongated projectile toward the rear end in a more or less flattened form, substantially as and for the purpose herein specified.

Second, So ballasting or distributing the weight of an elongated projectile as to keep a certain side of it always the lowest, substantially as herein described, with reference to Figs. 2, 3 and 7, for the purpose herein set forth.

45,022.—Enameled Projectiles.—John F. Cleu, of New York City. Ante-dated Oct. 30, 1864:

I claim the glazing of the exterior surfaces of projectiles for ordnance and firearms, substantially as and for the purpose herein set forth.

45,023.—Sabots for Ordnance Projectiles.—John F. Cleu, of New York City. Ante-dated Oct. 6, 1864:

I claim, first, The sabot, composed of two or more longitudinal pieces, B B, of wood or other material, arranged side by side, and united only at their rear ends by a metal band, C, thereby enabling it to be attached tightly to the projectile by an elastic pressure, substantially as herein specified, without the aid of straps.

Second, The metal supporting pieces, D d D d, fitted into and secured to the body of the sabot, to operate substantially as herein set forth.

45,024.—Fuse for Explosive Shells, etc.—John F. Cleu, of New York City:

I claim the combination of the perforated tube, B, extending through the charge to be exploded, and the pin or rod, E, inserted into the said tube, and connected or held therein by the fulminate priming, substantially as herein specified.

45,025.—Steam Generators.—J. E. Craig and J. Madden, of Cleveland, Ohio:

We claim, first, The arrangement of the opening, b'', furnace, C, and flue, D, in combination with throat, e, and valve, D', substantially as and for the purpose set forth.

Second, The pipe, E, and pipe, H, in combination with the flue, D, substantially as and for the purpose set forth.

Third, The valve, J, and diaphragm, F, in combination with the pipe, E, flue, D, and boiler, when arranged, substantially as and for the purpose set forth.

Fourth, We claim the annular chamber, b', and box, B, in combination with the fuel throat, d, and boiler, when arranged, substantially as and for the purpose set forth.

45,026.—Churn Dashes.—A. W. Cramer, of Bethany, Pa.:

I claim the combination and arrangement of the handle, a, cross piece, b, cross pieces, c c, pieces or springs, d and f, rollers, e and g, with the center board, h, substantially as and for the purpose set forth.

45,027.—Gun Cleaner.—Moses G. Crane, of Charlestown, Mass.:

I claim, first, Making the gun cleaner of a series of leaves or springs, which are held together normally, and spread open by the action of an expander, substantially as described.

Second, I also claim the combination of the tongue, the expander and the depressions in the spring, arranged and operating together, substantially as set forth,

45,028.—Compound Oil.—Anson Dart, of Dartford, Wis.:

I claim the use of an oily substance, composed of oils extracted from the olive and the seeds of the India musk melon (to be used as above), as a preventive or protection against taking the diseases, as herein described.

45,029.—Labels or Tags.—Thos. B. and Linson De Forest, of Birmingham, Conn.:

We claim the combination of the metallic-bearing surfaces, c, or their equivalents, with the label, A, and eyelet, b, the whole arranged to operate substantially as and for the purpose set forth.

45,030.—Furnace and Cupola.—Zabina Ellis, of Philadelphia, Pa.:

First, I claim forming within the body of a furnace, and beneath the bed of the same, a reservoir, H, having a tapping hole, h, and slag hole, i, all substantially as described.

Second, The doors, E and E', and plate, F, combined and arranged in respect to the body of the furnace substantially as specified.

45,031.—Boiler for Heating.—Zabina Ellis, of Philadelphia, Pa.:

I claim the boiler, consisting of the hollow cast-iron cylinder, A, with a socket at each end, and a cast-iron head, secured to each socket by a dovetailed packing of lead or other suitable material, all as set forth.

45,032.—Musketo Bar.—William Field, of Providence, R. I.:

I claim a musketo bar, furnished with a hinged frame, C, to support the netting over the head of the sleeper, or permit it to be folded back, substantially as described.

Second, In combination with the frame, C, I claim the posts, B, and hooks, c, or other attachments, to support the said frame in its elevated position.

[The object of this invention is to enable the person making up the bed to fold the webbing into a compact bundle, and place it out of the way at the head of the bed.]

45,033.—Churns.—C. W. Gage, of Homer, N. Y.:

First, The employment of two double-headed reciprocating dashers, constructed, arranged and operating in the manner and for the purposes specified.

Second, I claim, in combination, the lever, F, connecting rods, E E', hollow journal, c, key, b, and dasher rods, R R', when the several parts are arranged as and for the purposes set forth.

45,034.—Feed-roll Boxes for Wool-burring Machines, etc.—C. L. Goddard, of New York City:

I claim so combining and arranging the upper and lower feed-roll boxes that the upper one is adjustable in the arc of a circle, concentric to the axis of the lower one, substantially as herein specified, for the purpose of enabling it to be set backward or forward without altering its distance therefrom.

45,035.—Concussion Fuse for Shells.—Wm. F. Goodwin, of New York City:

I claim a concussion fuse provided with a sectional tube, H H1 H2, constructed and adapted to operate in the manner and for the purposes herein described.

The subject of this invention is a combined shell and fuse, adapted to be ignited by fire from the projecting charge, without the aid of a quick match, and exploded instantaneously on striking or falling.]

45,036.—Plow.—Loure Green, of Great Bend, Pa.:

I claim the combination of the center wheel or roller, W, with the adjustable brace rod, B, constructed and operating substantially as set forth

45,037.—Sawset.—John Hanford, Jr., of Detroit, Mich.:

I claim the combination of the reversible anvil piece, A, with its anvil faces, having curvatures of different radii, in combination with an adjustable set gauge or gauges, C, whose vibration affords an additional means of limiting on either face the set of the teeth, and the screws, B, or other suitable support for the back of the saw.

45,038.—Mode of Canceling Postage and Revenue Stamps.—Charles W. Harris, of Pittsburgh, Pa. Ante-dated Feb. 1, 1864:

I claim the mode of canceling Government stamps, whether postage or revenue stamps, by tearing them by means of a string interposed between the stamp and the letter or instrument of writing to which it is attached, substantially as described.

Also, constructing Government stamps with a string or strings attached thereto, for the purpose of cancelation, in the manner described.

45,039.—Sectional Boat.—Eldridge Heath, of Rochester, N. Y.:

I claim, first, The recess or cavity, O, between two adjacent ends of the sections of a boat, substantially as described.

Second, The combination of the windlass and chain, the dead-eye arrangement, U, and the extended rails, p and q, for the purpose of connecting adjacent sections of a boat, substantially as described.

[This invention consists in making a boat for canal navigation, of two or more sections, and forming the connections so that the rudder of the forward section is inclosed when the sections are together within a recess formed between them. The rails of the sections are extended so as to furnish means for securing them to each other, and the ordinary dead-eye arrangement is also used for this purpose.]

45,040.—Pumps.—Birdsill Holly, of Lockport, N. Y. Ante-dated Jan. 17, 1864:

First, I claim a hollow revolving tight-top, B, having the operating lever secured thereto, in combination with an open pump-stock, A, substantially as herein described.

Second, I also claim, in combination with the above, securing and tightening the revolving top in its seat, and still allowing it a free revolving motion, by means of the rim, f, and inclined bearing screw, k, or its equivalent, arranged, combined and operating substantially as herein specified.

Third, In combination with the revolving top, B, and stock, A, I also claim the radial spurs or projections, h h, for sustaining said revolving top in a central position, and allowing the free passage of water to the discharge spout, substantially as herein set forth.

Fourth, In combination with the revolving top, B, I also claim the operating lever, C, forming a tight joint therein, by means of the thin, rounded bearing, m, and shoulders, l l, arranged and operating substantially as herein set forth.

45,041.—Machine for Drawing Spring Points.—Edwin J. Homer, of Wilmington, Del.:

I claim the cylinders, H, in combination with the dies, M and N, the whole constructed and operated substantially as and for the purpose herein set forth.

45,042.—Nautical Logs.—Truman Hotchkiss, of Stratford, Conn.:

I claim the employment of a winged log or propelier, A, in combination with the cord, C, and clock-work indicator, substantially as set forth and for the purpose described.

45,043.—Magazine or Self-loading Firearm.—G. W. Hughes, of Bloomington, Ill.:

First, I claim pivoting the rolling breech-piece, C, upon the circular head of the lever, b, as shown and described.

Second, I claim the sliding breech block, D, when constructed with the flange, having an opening for the hammer to strike through, and, operating in connection with block, C, as herein set forth.

Third, I claim pivoting the lever guard, b, breech piece, C, hammer, E, and the independent cocking device, all upon a single bolt, substantially as shown and described.

Fourth, I claim the retractors, g g, when constructed and operating as set forth.

Fifth, I claim the use in a magazine gun of a chain constructed and operating substantially as set forth.

Sixth, I claim the plate, G, or its equivalent, when constructed and operating as and for the purpose herein set forth.

Seventh, I claim the independent cocking device, when constructed and operating as shown and described.

45,044.—Catch or Fastening for Breastpins, Earrings, Etc.—Jerome N. B. Jaquith, of Boston, Mass.:

I claim a fastening for breastpins, shawl pins, earrings, and like articles, composed of the pin, B, slotted projection, c, and catch, C, all constructed and arranged in the manner substantially as herein shown and described.

45,045.—Damper.—J. G. Jennings, of Cleveland, Ohio:

I claim the hinged damper or door, c, screw, E, arm, D, jointed to the lug, b, of the damper, in combination with the fireplace chimney, when arranged as and for the purpose described.

45,046.—Machine for Cutting Soles of Boots and Shoes.—Elijah D. Johnson, Jr., of Augusta, Maine:

I claim the combination for intermittently revolving the sole cutter, the said combination consisting of the wiper or arm, S, projecting from a shaft, b, and provided with a roller, g, the lever, h, the rack, k, the pinion, l, the ratchet, n, the pawl, m, and the spring, g2, the whole being arranged and applied together and to the frame, A, and the shaft of the cutter stock, in manner and so as to operate substantially as herein set forth.

I also claim the arrangement of the lever, r, the rod, q, the lever catch, n, the spring, p, and the catch wheel, m, with the cutter shaft, E, and the mechanism as described, for rotating such shaft, substantially as specified.

I also claim the combination for operating the gauge, L, the same consisting not only of the adjustable gauge supporter, U, and its elevating spring, y, but of the spring latch, f, its lever, b', and the tripper or post, K, the whole being applied together and to the gauge, the bed block carrier, and a stationary cross bar c', substantially in manner and so as to operate as specified.

45,047.—Wool-burring Machines.—Daniel and George T. Jones, of Philadelphia, Pa.:

We claim, first, The combination of the fluted roller, E, or its equivalent, and one or more burring cylinders, so arranged as to form a pocket between the fluted roller and one of the cylinders, the roller, E, running at a less velocity than the cylinder, D, thereby more fully cleaning the burrs.

Second, The combination of two burring cylinders, B and D, when used in conjunction with a carding engine or cylinder, A, the cylinder, D, being caused to run at a higher rate of speed than cylinder B, and acting to cylinder, B, as a clearer of the burrs with the small portion of wool which adheres to them, the main portion of the wool being stripped from cylinder, B, by the carding cylinder, A.

45,048.—Mode of Preparing Ores.—Edward N. Kent, of New York City:

I claim the preparation of crushed or pulverized ores and tailings, by caking them with a solution of chloride of sodium, or salt and water, introduced in any manner so as to admit of forming the crushed ore into cakes, lumps or bricks, as specified.

I also claim as my invention the calcination of crushed ores and tailings in a common stove, furnace, heap or kiln, when previously prepared by a solution of chloride of sodium, or salt and water, and made in lumps of any form, so as to admit of the decomposition of the salt, by the passage of a current of heated air through the interstices of the lumps so formed, substantially as herein described.

45,049.—Washing Machine. Thomas W. S. Kidd, Springfield, Ill..

I claim, first, The apron, C C', having its ribs attached or secured by means of fastening cords or devices which are sewed or lasned into recesses, c', and thus protected from wear, substantially as herein set forth.

Second, In combination with the frame, F f f', I claim the arms, D2, on the frame, D1, for tightening the apron and facilitating its removal, as set forth.

Third, I claim the corrugated and removable rubber, D3, occupying journal bearings of removable rollers, D4, and employed in combination with the rollers, D, as and for the purposes herein specified

45,050.—Carriage.—Charles P. Kimball, Portland Maine:

I claim my arrangement and application of the front jump seat, B, with the floor and front posts of the carriage body the same being in such manner that when such seat may be turned up or back, it shall be supported directly against such front posts and by them and its parallel bars or legs, d d, and when thrown forward it may rest upon the floor or the supporting frame thereof.

I also claim the combination of the lateral supporters, e e, with a jump seat so arranged that when turned back it may be supported by the front posts, as described.

45,051.—Construction of Bridges.—Z. King, Cleveland, Ohio:

I claim, first, The beams, A, and chords, B, in combination when the beams, A, pass through chords, B, and are secured in the manner and for the purpose substantially as specified.

Second, I claim the beams, F and G, and braces, D, in combination with the beams, A, and chords, B, the several parts being constructed and secured together, substantially in the manner and for the purpose set forth.

Third, I claim the towers, H, in combination with the chords, B, and beams, A F and G, when constructed substantially as set forth.

45,052.—Artificial Arm.—Dieterick W. Kolbe, Philadelphia, Pa.:

I claim, first, The within-described devices or their equivalents, so arranged in respect to an artificial arm and detachable hand, and so operating that the mechanism in the arm may be connected to, or detached from, that in the hand, substantially as specified.

Second, The levers, 4, arranged and operating in respect to the mechanism in the fingers and thumb, substantially as and for the purpose described.

45,053.—Stair-rod.—S. C. Lane, Philadelphia, Pa.:

I claim, first, A stair-rod composed chiefly of plate glass employed in any manner, substantially as described and for the purposes set forth.

Second, I claim the combination with the glass plate, B', and metallic frame, B, of the padding, D, composed of Canton flannel or analogous yielding material, and employed in the manner and for the purpose set forth.

45,054.—Screw-cutting Machine.—L. W. Langdon, Northampton, Mass.:

I claim, first, In combination with a mechanism for cutting screws from wire, a chuck so arranged that the length of each screw may be adjusted while the machine is in motion.

Second, Also the combination of an adjustable length gage with the means for operating the chuck, substantially as described.

Third, I claim attaching the tool which cuts of the screw to the revolving head, thereby dispensing with the ordinary cross-head.

Fourth, Also in combination with a rotating tool carrier the means for intermittently operating the same, when arranged substantially as described.

Fifth, Also the arrangement of an adjustable stop with each socket in a rotating tool-holder, so that by the operation of said stops on some fixed part of the tail stock, each tool may be separately and easily adjusted as to its own extent of forward movement.

45,055.—Nitre Box.—L. W. Langdon, Northampton, Mass.:

I claim constructing the nitre box with rotary saw guides, c f, when such guides operate in cylinders or tubes, b d, and are so constructed and applied that they may be changed from one set of cylinders to another, substantially as set forth.

I also claim making the cylinders or tubes, d, in which the guides operate, integral with the side of the box, as described.

45,056.—Lever Jack.—James Leffel, Springfield, Ohio:

I claim, first, The body or standard, B, when constructed and operating in the manner and for the purpose herein set forth.

Second, I claim providing the solid support of the pawl, g, in the manner herein described.

Third, I claim constructing the head of the lever, D, in the manner shown and described.

45,057.—Adhesive Postage and Revenue Stamps.—Henry Lowenberg, New York City:

I claim a self-canceling postage revenue or other stamp produced by applying to a transparent material an adhesive substance and printing or otherwise producing the desired picture, characters, or design upon the surface of the adhesive material by which the stamp is to be stuck upon a letter, document, or other object, substantially as described.

45,058.—Axle Box for Car Trucks.—Wm. Loughridge, Weverton, Md.:

I claim, first, The stuffing box composed of the leather, B, or its equivalent, annular socket, a, metallic packing, b, and pressure plate, E, substantially as described.

Second, The arrangement of the springs, d d', and rods, F F, with the socket, a, and pressure plate, E, all arranged to operate substantially as and for the purpose set forth.

45,059.—Sewing Machine.—W. A. Mack, Cleveland, Ohio:

I claim, first, The arrangement of the shuttle holder, I, race, J, and shuttle, H', in combination with the vibrating arm, H, socket, H''', lever, u, and cam, V, constructed and operating as and for the purpose set forth.

Second, I claim the spring, n, in combination with the screw, N, and shuttle, as and for the purpose described.

45,060.—Horse Collar.—George F. Marshall, Cleveland, Ohio:

I claim the metallic tree or frame, A, constructed and applied to the horse collar, B, substantially as and for the purpose herein set forth.

I further claim in combination with the tree or frame, A, the chafing leather, C, point, c, or check hook, either or both on the part, p, of the tree or frame, and the straps, D D', all arranged and applied to the horse-collar, substantially as herein described.

[This invention consists in the employment or use of a metallic tree or frame with chafing leather or pads attached, and applied to the top or upper part of a horse-collar in such a manner as to effectually prevent the hame straps from galling the horses neck or wearing the mane, and also prevent the hames from slipping over the rim of the collar at the top, and at the same time be capable of being adjusted so that the collar may be varied in dimensions to suit the neck of a horse.]

45,061.—Harvesting Machine.—David J. Marvin, Stockton, Cal.:

First, In a combined header and thresher, I claim so pivoting or hinging the cutter frame upon the main axle, a, that it can be moved longitudinally, and also raised or lowered at pleasure, substantially as and for the purpose specified.

Second, In a combined header and thresher having its cutter frame mounted or hinged as above described, I claim the combination and arrangement of the bar, a', posts, b' b', pulley, d', cord, c', and crank-rod, N, substantially as and for the purpose herein set forth.

45,062.—Hoisting Machine.—Douglass McIntyre and George C. Reeves, Central City, Colorado Territory:

We claim the two bevel toothed wheels, B B, placed loosely on the shaft, A, with the horizontal toothed wheel, C, gearing into them, in combination with the friction pulley, D D, keyed or otherwise, secured on the shaft, A, the stationary rings, D', and the movable rings, E, provided with the beveled projections, b b', and also placed on the shaft, A, all arranged to operate in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and improved hoisting apparatus, designed more especially for elevating or drawing water, but applicable to other purposes. The invention consists in a novel and improved arrangement of a friction clutch and gearing, whereby the motion of the gearing may be reversed at the will of the attendant, and any number of devices operated from one and the same shaft.]

45,063.—Automatic Gate.—George McKnight, Hebron, N. Y.:

I claim the two sleepers, A A, in combination with the gate, D, the latter being attached by hinges to one of the former, and a ditch or trench, C, being between the sleepers, all arranged substantially as and for the purpose specified.

I also claim the two levers, F F, applied to the gate, D, and suspended from the uprights, H H, substantially as and for the purpose herein set forth.

I further claim the extension rail, I, when applied to the gate, D, to operate automatically therewith, substantially as and for the purpose specified.

[This invention relates to a new and improved gate of that class

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which admits of being opened and closed by a rider or driver without the latter dismounting from a horse or getting out of a vehicle

45,064.—Calendar for Almanacs.—John H. Mead, New York City. Ante-dated Nov. 3, 1864:

I claim the combination and arrangement of the stationary sections, A, and revolving rings, B, constructed as and for the purposes set forth.

45 065.—Tree Protector.—Benjamin Merritt, Jr., Newton Corner, Mass.:

I claim the apparatus having a construction, substantially as and for the purpose specified.

45,066.—Cultivator.—George D. Miller, Lovington, Ill.:

I claim, first, The swiveled frame, D D D1 D2, in combination with the segmental pulley, E, bar or lever, E', foot-piece, e e, cords, H, and pulley, J, the whole being arranged to operate substantially as and for the purposes herein set forth.

Second, I claim the manner herein described of employing the roller, R, so that it may be adjusted simultaneously with the plows, by means of the lever, O.

45,067.—Harvester.—S. M. Moore, Beloit, Wis.:

I claim the combination of the hand lever, L, post, M, and link bar, N, with the finger-beam, when arranged and operating substantially as described and for the purpose set forth.

I also claim the combination of the main frame, finger-beam, rock-shaft, radius bars, racks and pinions, hand-lever, lifting chain and link bar, as described for the purpose set forth.

45,068.—Drill and Sand Pump.—Enoch R. Morrison, New York City:

I claim, first, The peculiar form of the drill head, so constructed and combined with a cone or ball valve and a hollow shaft, as to perform the double action of a drill and sand pump for boring oil wells, as herein described.

Second, I claim the manner of taking up the detidus in boring wells, and discharging the same from the openings at the lower end near the bottom of the drill, as herein specified.

45,069.—Water Wheel.—Henry G. Nelson, Lockport, N. Y.:

I claim the combination of the turbine buckets, K K, with the horizontal buckets, C C, shaft, A, scroll, G, and annular eduction passage, I I, arranged and operating substantially as set forth.

I also claim the diaphragm, H, in combination with a wheel composed of the straight buckets, C C, and turbines, K K, arranged in the manner and for the purpose described.

In combination with the collars, B B', on the shaft, A, and buckets, C C, I claim the supporting lip, a, flange, b, and pin, c, operating conjointly with the bolt, f, substantially as and for the purpose set forth.

45,070.—Hoop Skirt.—Frederick S. Otis, Brooklyn, N. Y.:

I claim, first, Forming the covering to the ends of the bustle hoops where they are attached to the tapes of a woven fabric secured to the tapes and hoops by small clasps or spangles, and having a strip of kid or similar material at the edge of said covering, as specified.

Second, I claim the clasp, f, formed in the manner specified and securing the hoops, where they are brought end to end, in the manner set forth.

45,071.—Clothes-wringer and Mangle.—S. W. & J. F. Palmer, Auburn, N. Y.:

We claim the arrangement of the levers, F, for carrying the upper or yielding roll, and their connection with the frame, and non-yielding roll, as and for the purpose described.

We also claim in combination with the wringer and mangle, the cams, h, levers, b, springs, i, and projections, n m, for making a clamping device, for holding the machine to a tub, table, stand, or other support, substantially as described.

45,072.—Evaporator.—Wm. H. Parmelee, Hopkins, Mich.:

I claim, first, The arrangement of the pipe, I, trough, J, valve, I', rod, l, float, L', and curb, L, in combination with the pans, A and B, when operating conjointly, substantially as and for the purpose specified.

Second, I claim the float, n, cistern, D', valve with the stem, p, balance beam, p', in combination with the evaporator, substantially as and for the purpose set forth.

45,073.—Life Raft.—E. L. Perry, New York City:

I claim, first, The cylinders, C, attached by membranes to the framing of the raft and provided with stays, D, and lacing cords, d, substantially as described and represented.

Second, I claim in combination with the above the inner elastic air and waterproof sacs, O, for the purpose set forth.

45,074.—Stove.—Moses Pond, Boston, Mass.:

I claim a stove of the kind described (that is, one having an oven over its fire-place or flue leading therefrom), as made with or having means of fastening the cover of its oven bottom plate opening down to such plate, for the purpose set forth.

45,075.—Skate.—Washburn Race, Lockport, N. Y.:

I claim a cast-iron skate runner with chilled running edge or surface, as a new article of manufacture.

45,076.—Cheese Vat.—William Ralph, Utica, N. Y.:

I claim the false bottom partition or diaphragm, D, so constructed as to keep the water heated by the heater, E, from contact with the bottom of the inner vat, B, until it shall have been in contact with the sides, or the sides and ends thereof, and imparted a portion of its temperature to the same.

I also claim the hollow supports, g, used in combination with the outer vat, A, inner vat, B, or the false bottom or partition, D, substantially as and for the purpose described.

I further claim the use of one or more pipes, F, in combination with the valves or damper, n and P, for the purpose described.

45,077.—Fastening Buttons to Fabrics.—W. H. Reed, Philadelphia, Pa.:

I claim, first, The use for fastening buttons to fabrics of a rivet having a stem countersunk at the end, substantially as and for the purpose set forth.

Second, The rivet with its countersunk stem in combination with the annular ridge, d, of the button.

45,078.—Latch.—Jacob C. Robie, Binghamton, N. Y.:

I claim the mode of locking or bolting a door knob latch, by means of the slide and spring, connected with a bolt or pin which passes through the wood-work of the door and the shell or case of the door knob latch, into the latch, in such a manner that said latch cannot be drawn back or moved from its position by means of the knob, when the bolt or pin is pressed into it, as set forth.

45,079.—Priming Metallic Cartridges.—E. K. Root, Hartford, Conn.:

I claim a cartridge case formed with a centrally located teat or projection, in combination with a fulminate disk, substantially as and for the purposes set forth.

5,080.—Combined Portable Sheep Rack, Shed and Fold.—S. L. Sage & O. T. Baker, Huntington, Ohio:

We claim, first, The sections, A A, when constructed and arranged as described, and provided with feed-racks, in the manner and for the purpose specified.

Second, We claim the combination of the fence, I, with the sections, A A, whether said sections are united as shown or placed end to end, as described.

45,081.—Manger.—Daniel Sager, Albany, N. Y.:

I claim, first, The rotating manger, provided with the journals, o, and rod, D, substantially as shown.

Second, The bracket, 6, or its equivalent, when used in combination with the manger, as and for the purpose set forth.

45,082.—Friction Apparatus for Warp-dresser Beams.—Benjamin Saunders, Nashua, N. H.:

I claim the application of the friction weight, G, to the dresser beam by means of a vibratory arm, D, and in manner and so as to operate with such beam, substantially as hereinbefore described.

I also claim the application of the friction weight, G, to the vibratory arm, D, by means of a hinge connection or its equivalent, in order that the weight may be free to adjust itself to the periphery of the yarn on the dresser-beam.

I also claim the combination of the sliding journal, E, with the stationary bearing, F, and the vibratory arm, D, and weight, G, applied to the section or dresser-beam, substantially as described.

I also claim the combination of the adjusting screw, e, and nut, f, with the sliding journal, the vibratory arm and the friction weight applied to the section or dresser-beam, in manner as specified.

I also claim the combination of the retainer, h, and the groove, g, with the milled nut, f, the screw, e, the sliding journal, the vibratory arm, and the friction weight applied to the section or dresser-beam, in manner and so as to operate therewith substantially as hereinbefore explained.

45,083.—Manufacture of Spiral Tubing.—Edward H. Savoral, Washington, D. C.:

I claim the manufacture of circular spiral or otherwise curved pipes, made of hard sheet metal, in the manner described within and for the purpose set forth.

45,084.—Forming Sockets on Terra Cotta Pipes.—Louis Scharff, Conshohocken, Pa.:

I claim forming sockets on terra cotta pipes by the aid of the block, B, and former, D, substantially in the manner and for the purpose described

45,085.—Faucet.—Henry Schnoutz and Henry Bremen kamp, Cincinnati, Ohio:

We claim the hollow plug, C, divided by a horizontal partition, f, in two distinct compartments, d e, and provided with two holes, a' b', to operate in combination with the shell, A, and double channeled shank, B, substantially in the manner and for the purpose herein shown and described.

[The object of this invention is to arrange a faucet in such a manner that by turning the plug a vent hole or channel is opened simultaneously with the discharge channel, and the liquid from an air-tight barrel can be drawn without disturbing the bung.]

45,086.—Apparatus for racking off Wines, Liquors, etc.—Daniel Sexton, San Gabriel, Cal.:

I claim racking off wines and other liquors by means of an air pump constructed on the principle of, or similar to, a bellows, and of wood and leather or other flexible material, applied in the manner substantially as and for the purpose herein set forth.

[The object of this invention is to obtain a means of racking off wines and liquors, that is to say, drawing them from one cask into another, without exposing them to the air and without disturbing the sediment in the cask from which the wine or liquor is drawn.]

45,087.—Tree Protector.—Albert Seymour, Hartford, Conn.:

I claim, as a new improved article of manufacture, a tree protector, each section of which being made in one piece of cast metal, with a trough, a, shed, b, partitions, d, prongs, d', substantially as shown and described.

45,088.—Buckle.—Josiah Shepard, New Britain, Conn.:

I claim the case, A, in combination with the plate, C, provided with pins, d d, at opposite sides, all arranged substantially as and for the purpose herein set forth.

45,089.—Drain.—George W. Smith, Springfield Township, N. J.:

I claim, as a new article of manufacture, the combination of the bottom slabs with the cleats, A, and the side slabs cut out so as to lock when set up, in the manner and for the purpose substantially as shown and described.

45,090.—Composition Oil for lubricating Paint, etc.—William H. Spooner, Bristol, R. I.:

I claim, first, The method herein described of preparing oil adapted for use as a lubricating, paint, wool, curriers, or other like oil, by combining with dissolved caoutchouc paraffine, oil, when said combination is effected in the proportions, and in the manner herein set forth.

Second, As a new article of manufacture I claim a composition oil, the same consisting of caoutchouc dissolved in hydro-carbon mixed with the oily distillates of coal, peat, tar, or petroleum, in the manner and the proportions set forth.

45,091.—Seat for Schools and Public Buildings.—David J. Stagg, New York City:

I claim a seat or settee for schools, public buildings, etc., having its seat-board, B, suspended between the uprights, A A, by means of pins, b, which project horizontally from the uprights and pass through or into cleats or ledges, C, at the ends of the seat boards and above them, said cleats or ledges having semi-circular slots, c, in them to receive stop pins, d, which are in front of the pins, b, and also above the seat boards, substantially as herein set forth.

[This invention relates to a new and useful improvement in that class of seats or settees for schools, public buildings, etc., which have their seat-boards so arranged that they may, when not in use, be folded upward out of the way, so as to afford an ample passage way between the rows of seats.]

45,092.—Sleeping Car.—Joseph Sutter, New York City. Ante-dated Nov. 3, 1864:

I claim, first, Sustaining the backs in a horizontal position by means of the swinging link, f, applied in the manner and for the purposes specified.

Second, I claim the folding extension piece, g, applied to the back and employed between one back and the other when in a horizontal position, as set forth.

Third, I claim the spring head rest, l or l', constructed and applied in the manner and for the purposes set forth.

Fourth, I claim the protecting bars, h, connected by the slotted bars, i, and slide bars, k, at the ends of the backs, forming the sides of the lounge or berth, for the purposes and as specified.

Fifth, I claim the folding extension leaves, g', turning up under the seats or reaching from one seat to the next, for the purposes and as specified.

45,093.—Skate.—R. Tillman, New York City

I claim, first, The forked lug, c, projecting from the outer or rear end of the slide, F, and applied in combination with the neck, d, in the shank of the screw, G, in the manner and for the purpose set forth.

Second, The serrated laterally moving slides, e e, in combination with the spring catch, h, and toe plate, D, constructed and operating substantially as and for the purpose described.

45,094.—Reaping and Mowing Machine.—John S. Truxel, Mt. Pleasant, Pa.:

I claim the main frame, A, and cutter bar frame, H, connected as shown, in combination with the pivoted seat support, C, and lever, E, all arranged to operate in the manner substantially as and for the purpose herein set forth.

I further claim the bar, F, provided with oblong slots, d, to receive the catch, G, and admit of the up and down self-adjusting movement of the cutter bar, as set forth.

45,095.—Fruit-gatherer.—Jacob Vail, Newfield, N. Y.:

I claim, first, The employment of the box, C, elevated in the manner described, and suspended from the beam, B b, so as to be turned about the central pole or standard, A, in the manner and for the purpose explained.

Second, I claim the pulley, F, operated by the cord, G, and adapted to traverse the slot, b2, to move the box, C, toward or away from the center of the tree, as and for the purpose set forth.

Third, In combination with the box, C, for gathering fruit, I claim the arrangement of the block and tackle, E E', windlass, D', crank, D, and pulley, e, substantially as described.

45,096.—Rotary Pump.—Andrew Walker, Claremont, N. H.:

I claim, first, The rotary piston, L, substantially as described and for the purpose set forth.

Second, The combination and arrangement of the rotary piston, L, the horizontal floats or pistons, c and d, the ball valves, E and F, the ball valve, K, the orifices, G and H, substantially upon the principle and in the manner herein set forth.

45,097.—Machine for Sawing, Boring, and Mortising.—Levi J. Wallich, Knoxville, Ill.:

I claim the arrangement of the screw and smooth-pointed augers, L L, chisels, M M, and lever, Q, and the arrangement of the ground auger, F, guides, f f, and spring, f', for throwing same up or down, and the arrangement of the notched lever, J'', bearing lever, J''', wood horse, J, and saw, G'', in combination with the gate, C, and frame, B, substantially in the manner and for the purposes herein specified.

45,098.—Board-holder in making Board Fence.—John Wallmer, Goshen, Ind.:

I claim the two strips, A A', and transverse piece or rest, B, in combination with the screw bolt, D, and adjustable stop, d, all arranged substantially as and for the purpose herein set forth.

[This invention relates to a new and improved device for holding boards while nailing the same to the fence, so that the boards may all be secured to the posts at equal distances apart, and by one hand or man only.]

45,099.—Horse Rake.—C. W. Warner, Williston, Vt.:

I claim the method, substantially as described and represented, of operating the same by means of the combination of the foot-triggers, K K', bar, J, and rocking pawl, f g, with the notched bars, h, on the rake head.

[This invention consists in attaching an ordinary revolving rake to an axle mounted on wheels and having thills attached to it, all being arranged in such a manner that the driver may ride on the machine and operate the rake with the greatest facility, and the latter at the same time be capable of being adjusted or turned over on the axle, for the convenience of drawing or transporting the device from place to place.]

45,100.—Knob-latch.—Rodolphus L. Webb, West Meriden, Conn.:

I claim the combination of the latch, a, collar, c, spring, e, with the yoke and thimble, all constructed and arranged as described.

45,101.—Water Wheel.—Charles Weed and William C. Marr, Eldorado, Iowa:

We claim a water wheel provided with buckets, B, with a projecting center and recurved receding wings, as represented in the drawings, and operating in combination with the rings, f, and central rotary gate, i, in the manner and for the purpose substantially as herein shown and described.

45,102.—Siphon Water Wheel.—Thomas Welham Brownsville, Nebraska:

I claim keeping the water enclosed in a siphon, after it leaves the first wheel, and conducted through the siphon enclosing any number of wheels, at any required distances apart by which the water is used over a series of wheels from the same head, as herein described and for the purposes set forth.

45,103.—Machine for making Sheet Metal Ware.—Morris Wells, Williamsburgh, N. Y.:

I claim the application of the secondary cylinder, M, in combination with the plates, I J, female die, B, plunger, H, and main cylinder, E, constructed and operating substantially as and for the purpose set forth.

45,104.—Soldiers' Shoulder-brace for Knapsacks.—H. S Weston, Akron, Ohio:

I claim the metallic shoulder-brace, in combination with the strap B, when constructed and arranged substantially as and for the purpose described

45,105.—Self-loading Fire-arm.—Robert Wilson, Macomb, Ill.:

I claim, first, Combining with a vertically-sliding chambered breech-block, D, and pivoted guard lever, E, a sliding feeder, J, or its equivalent, constructed and applied to said lever, and a chambered gun stocked in such manner as to feed the cartridges therefrom and introduce them one at a time, into said breech-block, substantially as described.

Second, The use of spring hooks, d d, or their equivalents, applied to the breech-block, D, and operating in conjunction with the guard lever, E, substantially as described.

Third, The sliding strap, J, when constructed with spring fingers, h, and applied to a lever guard, E, and the stock of a gun, substantially as described.

Fourth, The cartridge magazine, G, when it is provided with lateral followers, g' g', and spring fingers, f f, or their equivalents, substantially as described.

Fifth, A removable cartridge case or holder, G, in combination with contrivances for impelling the cartridges laterally downwards and then forwards, substantially as and for the purpose described.

45,106.—Shoe for Car Brakes.—Joseph Wood, Red Bank, N. J.:

I claim, first, The sole, B, its lugs, c and c', and lug, d, in combination with the shoe, A, the latter and the sole being constructed and adapted to each other so as to be secured by a simple pin i, substantially as specified.

Second, A groove or grooves, x, formed in the face of the sole, substantially in the manner and for the purpose set forth.

45,107.—Loom for weaving Hair Cloth.—Isaac Lindsley, North Providence, R. I. Patented in England Sept. 21, 1863:

I claim, first, So combining and arranging the selecting or serving instrument and the nipper, and the mass of weft presented thereto, as described, that the end of the weft that has been selected will be deflected and held aside from the mass directly across the path of the nipper, which is thus enabled to seize the weft between the selecting instrument and the mass, substantially as described.

Second, I claim the employment of two projecting pegs, or their equivalent, in the jaws of the nipper, substantially as described to effect the purpose specified.

Third, I claim the mode of operation, substantially as specified, by which the nipper is first closed sufficiently to encompass and secure the hair or weft, and at the commencement of its retreating movement the jaws are made to close gently upon the hair or weft, with sufficient force to hold the same and draw it from the mass into the open shed, substantially as described.

Fourth, I claim the employment of two sets of fixed and movable pulleys, o o' p p', or their equivalent, in combination with the treadle levers, R' R', and a suitable strap or band connecting with the nipper staff, substantially as described for the purpose specified.

Fifth, I claim giving to the cam shaft or its equivalent that works the heddles or harness an intermittent rotation at each change of the shed by means of a ratchet and pawl, or other suitable devices, whose operation upon the cam shaft is made to depend upon the supply of weft to the shed.

Sixth, I claim the arrangement of the cams, r1 r2 r3 r4, or their equivalent, which operate the selvage heddles or harness, substantially as and to effect the purpose specified.

Seventh, I claim combining a positive "take up" and a positive "let off" with the devices that actuate the same, so that when the weft fails to be supplied to the shed, their operation will be arrested and will be resumed when the weft is duly supplied.

Eighth, I do not claim the use of a waved reed for giving a permanent waved firm to the weft, but I do claim placing the weft in the cloth by means of the curved reed or otherwise in such a position as will counteract the effect of the unequal shrinkage of the parts, substantially as described.

Ninth, I claim combining with the automatic "serving" mechanism a detent or stop, so arranged as to work in concert with the nipper and arrest the operation of the serving mechanism when in a position to be out of the way of the nipper as it advances to seize the weft, and to release the serving mechanism after the nipper has retired, substantially as described.

Tenth, In combination with the mechanism which supplies the weft to the nipper, or its equivalent, I claim the employment of a clipping or shearing device, substantially in the manner and for the purpose described.

45,108.—Apparatus for applying Adhesive and Lubricating Material to the Spindles of Spinning Machines.—James Marshall, Stockport, Great Britain. Patented in England, Oct. 28, 1863:

I claim, first, The application of the friction created between the revolving spindles and a part or parts of the paste or oil receptacle, for the purpose of effecting the traverse of the same along the spindle carriage behind the spindles in mules.

Second, The receptacle or box containing adhesive substances or lubricants, and for applying the same to spindles, constructed and arranged substantially as described.

45,109.—Roller for Cotton Gins.—Wm. Wauklyn, the Albion Mills, Bury, England:

I claim a roller for cotton gins made of cast-iron or other metal, with its grooves cast or cut in the solid face of the periphery of the roller, and with a "land" between, serrated, wrinkled or notched, as herein described and represented.

45,110.—Machine for tapping Nuts.—F. Watkins, London Works, Birmingham, England:

I claim, first, Grouping six or more revolving sliding spindles, around an upright driving shaft, the said shaft giving motion to the

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spindles and taps which they carry in combination with the levers, P, all constructed and arranged as described.

Second, In combination with the subject matter of the above I claim so proportioning the gearing between the driving shaft and the various spindles, that two or more spindles will be driven at different rates of speed, and with greater or less power, so as to adapt the machine for different classes of work.

[The object of this invention is to group a series of revolving sliding spindles around an upright driving shaft so that a number of operatives may work simultaneously at one and the same machine. The different spindles are geared up so that they rotate at different velocities according to the class of work to be performed by each of them, and they are perforated with longitudinal central channels through which oil, soap suds or other lubricating substance can be readily introduced.]

45,111.—Fire-place and Furnace.—Edward Brown Wilson, No. 10 Strand, Middlesex, England :

I claim the method herein described of construction and working of fire-places and furnaces in such manner that when fresh fuel is supplied as usual on the top of the fuel already ignited, the gases generated therefrom are made to pass downwards through the hot fuel, air being supplied at such points and in such quantities as may be suitable for complete combustion, substantially as set forth.

45,112.—Stopping Bottle.—Albert Albertson (assignor to J. N. McIntire), New York City :

I claim a stopper or closing device for bottles composed of a valve or cork, in combination with a spring rod, or its equivalent, the whole constructed to operate substantially as herein before described,

45,113.—Armament of Ships of War.—Augusto Albini, Genoa, Italy, assignor to James Henderson :

I claim the construction and arrangement of the gun deck and bulwarks of a ship, in the manner herein described, so that the guns may be fired from the bow or the stern, or from both at the same time, in a direction parallel with the keel.

45,114.—Water Wheel.—H. K. Annis (assignor to Jason Kidder and Hiram C. Baker), Enfield, N. H.:

I claim the aprons, E E, in combination with the sectional wheel and issues, arranged to operate substantially as and for the purpose herein set forth.

I further claim the semi-annular chute, C, in combination with the water-passages, D D, aprons, E E, and sectional wheel, B, all constructed and arranged to operate in the manner substantially as and for the purpose specified.

[This invention relates to a new and improved water wheel of that ass which are placed on a vertical shaft, and are commonly termed horizontal water wheels. The object of the invention is to obtain a wheel of the class specified which may be made to give out or yield power less than its maximum, proportionate to the amount of water which passes through it.]

45,115.—Loom for Weaving Palm-leaf, Straw, etc.—J. M. Baker, Providence, R.I., assignor to himself and Elliott P. Gleason, New York City :

I claim, first, The combination of the nipper, arranged substantially as described, with recess, 4, the opening, 2, and the swing finger, R, the whole being arranged and operating substantially as described for the purpose specified.

Second, The described arrangement and method of operating the cloth and warp beams, whereby the warp is made to progress regularly by the action of the sley in beating up the successive lengths of weft, substantially as described for the purpose specified.

Third, The use of the cam, 3, or the equivalent thereof, arranged with the strap, V, and warp beams, B B', substantially as described for the purpose specified.

45,116.—Machine for making Rivets.—George B. Brayton, Providence, R.I., assignor to the Brayton Rivet Company :

First, I claim a machine, operating as described, so as to form a rivet by forcing the shank into the head, substantially as described.

Second, I claim the combination in one machine of the following elements, first, a mechanism for feeding the wire or rod to a cutter dividing it into shanks, and a mechanism for feeding the heads into the machine, as herein described ; second, a pair of nippers or grippers seizing the shank and conveying it successively to the head blank and hammer and the header, as herein described ; third, a plunger or hammer actuated to insert the shank into the head blank, and a header to force the shank home into the head against the heading die; fourth, a means for stripping the header of the finished rivet.

Third, I claim the employment of a pair of gripers which receive the shanks, one at a time, and whose motion is such as to present them first to the plunger or hammer for insertion of the shank into the head, then conveying them to the header and then release them, substantially as set forth.

Fourth, I claim the combination of the cutter severing the wire or rod as it is fed into the machine, with a griping lever mounted upon the cutter stock, so that the two being actuated by suitable cams move together in their translatory movement though acting as gripers, substantially as before described.

Fifth, I claim the combination of feed rollers feeding the wire or rod during the intervals of action of the plunger and header, as described, with a cutter and griping lever for action together, substantially as and for the purposes set forth.

Sixth I claim the combination of a hopper for supplying the machine with rivet head blanks, with a carrier so arranged as to seize one head blank at a time, presenting it to the plunger in position for the insertion of the shank, as set forth.

Seventh, I claim the means herein described for regulating the stroke of the plunger within the header, according to the length of the shank and to compensate for wear, substantially as set forth.

Eighth, In combination with the hammer for setting the shank into the head of the rivet, I claim a means for adjusting the same according to the length of the shank, and to compensate for wear, substantially as set forth.

45,117.—Saw Gummer.—L. A. Dole (assignor to himself and Albert R. Silver), Salem, Ohio :

I claim the employment of metallic clamps, B C, constructed to receive and hold the grindstone, and also to constitute a thin central plate for receiving the saw arbor and the collars thereon, substantially as described.

45,118.—Thill Attachment or Coupling.—C. W. Gage (assignor to himself and James Northrup), Homer, N. Y.:

I claim the combination of the jaws, b and d, constructed as described with the clip, C, for the purposes set forth.

45,119.—Clothes Pins.—Jeremiah Greenwood (assignor to himself and Wm. E. Arnold), Fitchburg, Mass. :

I claim the jaw, a, with its notch or recess, c, in combination with the wedge, e, operated by the rod, d, substantially as set forth.

45,120.—Grain Separator.—C. B. Hutchings (assignor to Maria Hutchings), Rochester, N. Y.:

I claim, first, In combination with the suction flue, B, the sliding divider, J, whereby without affecting the inflowing current the grain coming in contact with the current of air, is separated or graded so that the plump well filled grain, by reason of greater density, passes through the current, while the shrunken or poorer portion, with the refuse, is deflected from its course by the current and turned into the receptacle, M, preparatory to screening and cleaning.

Second, The horizontal suction flue, B, in combination with the double-headed fan, F, when the grain to be operated upon by the suction current is fed through it vertically or nearly so.

Third, The valve, d, in combination with two or more inducting flues, B and C, and double-headed fan, F, when said fan is inclosed in a vacuum chamber, G.

Fourth, The employment of the wind board, K, for the purpose of concentrating and directing the current preparatory to its acting upon the falling grain, as set forth.

45,121.—Pin-fastening for Medals, Breast-pins, &c.—G. O. Monroe, New York City, assignor to the Army and Navy Button Co., Waterbury, Conn.:

I claim forming the pins of breast-pins, medals, &c., of a headed pin passed through a hole or socket, in the manner and for the purposes specified.

I also claim forming the clasp or catch of a tongue pressed up from the plate, b, in the manner set forth.

45,122.—Washing Machine.—Herman Rice (assignor to himself and Moritz Fleischman), Youngstown, Ohio. Ante-dated Oct. 30, 1864 :

First, I claim the combination of the hinged cover or lid, A2, section A', and tub, A, with the interior box, B, adapted to be turned back with the section, A', for admitting of the insertion of clothes between the rubbers, C and J, as set forth.

Second, In combination with the above parts I claim the guides, D D, constructed and employed substantially as and for the purpose explained.

45,123.—Breech-loading Fire-arm.—Joseph Rider, Newark, Ohio, assignor to himself and E. Remington & Sons, Ilion, N. Y. :

I claim locking the hammer while the arm is being loaded or the bore is exposed for the insertion of the cartridge, substantially as and for the purpose set forth.

I also claim an auxiliary locking mechanism consisting of the recess, 1, in the breech plate, and the projection, 2, on the hammer, as and for the purpose described.

45,124.—Railroad Car Journal.—W. G. Smith (assignor to himself, John F. Barney, and Jacob A. Wilder), Chicago, Ill. :

I claim, first, The journal, I, when disconnected from the shaft of the wheel, substantially as and for the purposes set forth.

Second, Constructing a journal disconnected from the shaft varying in size, that is, having two or more different diameters, substantially as herein described.

Third, The combination and arrangement of the journal, I, the friction wheels, R and L, and the hollow hub, C, when constructed and operating substantially as specified.

Fourth, The combination and arrangement of the journal, I, the journal box, D, provided with the face plate, E, and the hub, C, when constructed and operating substantially as herein delineated and set forth.

Fifth, The combination and arrangement of the journal, I, the washer, P, and the hollow hub, C, when arranged substantially as herein described.

45,125.—Grain Screen and Sieve.—H. B. Thomas (assignor to himself and S. S. Merrill), Chicago, Ill.:

I claim in the construction of sieves or screens, the employment of the bent metallic strips, a, when constructed, arranged and operating as and for the purposes herein shown and described.

45,126.—Breech-loading Fire-arms.—Edward S. Wright (assignor to himself and George Brown), New York City. Ante-dated Nov. 19, 1864 :

First, I claim the hammer, H, and center, h, arranged to confine and release the movable piece, C, and to operate in combination with C, and the striking pin, D, substantially as specified.

Second, I claim the within-described arrangement of the main spring, I, sear J j, sear spring, K, and screw, L, for the purposes specified.

45,127.—Marine Propeller.—Richard Covington, Washington, D. C.:

First, I claim giving an oscillating motion to expanding and contracting paddle arms by means substantially as described.

Second, Reversing the action of expanding and contracting propellers by means of a rock shaft, f, and pendulum, F, acted upon by a fixed fork, H, or the equivalents thereof, substantially as described.

Third, The levers, D D', with an oscillating frame, C, moving about a fixed center, d, substantially as described.

Fourth, The fixed guide, c, and stops, c' c', in combination with a pivoted frame, C, and devices for oscillating this frame, substantially as described.

Fifth, The paddle, J j j, substantially as and for the purpose described.

Sixth, The employment of expanding and contracting levers, D D' D2 D3 and E E' arranged on each side of and supported by a fixed or an oscillating frame, C, or the equivalent thereof, substantially as described.

Seventh, The arms, D D2, pivoted at different points on the paddle arm, E, substantially as and for the purposes set forth.

RE-ISSUES.

1,819.—Apparatus for Combining Hydro-carbon Vapor with Air.—Oliver P. Drake, Boston, Mass. Patented Aug. 30, 1853 :

I claim the vaporizing chamber and rotary blowing apparatus combined in the manner and for the purpose substantially as set forth.

I also claim the combination of the vaporizing chamber and rotary blowing apparatus under the general arrangement described with a weight, or its equivalent, acting with a uniform force, so that the pressure at the burner is uniform whether a greater or less quantity of the mixed air and vapor is burnt.

I also claim the combination of the vaporizing chamber with the mechanical agitator, for the purpose of agitating the liquid during the mixture of the vapor with air, substantially as set forth.

I also claim the combination of the heater and gas burner with the water vessel and vaporizing chamber, substantially as specified, so that by means of the said heater and gas burner and the pipes connecting them with the water vessel and the chamber, the whole or part of the mixture of air and benzole vapor produced by the apparatus may not only be used in any convenient place for the purpose of illumination, but also for heating the water of the vessel, substantially as set forth.

I also claim the combination of the closed vaporizing chambers, the rotary vaporizer or disseminator, placed therein, and the rotary meter wheel and its closed case, or an air-forcing apparatus so made as to force a stream of air into the hollow shaft of the vaporizer and through or against saturated portions of the disseminator and into the vaporizing chamber or regenerator so as to vaporize the benzole or hydrocarbon and mix it with air, substantially as above specified.

And in combination with the rotating meter wheel and its case, and the hot water vessel, I claim the coiled induction air pipe, as made to pass through the water in the vessel and thereby receive heat therefrom so as to warm the air as it passes through the pipe and to supply oxygen to the volatilized vapors, and for the purpose of facilitating the evaporation of the same.

And in combination with the induction air pipe, I claim the chamber and its regulator slide and orifice applied for the purpose of supplying cold air to the warmed air or to the meter wheel, in order to diminish or regulate the temperature of the air passing into the said wheel and forced into the vaporizing chamber.

I also claim the peculiar mode of making the rotary disseminator or vaporizer, viz, of two perforated heads or disks, a hollow perforated shaft, and strands of lamp-wicking or other absorbent material stretched from one head to the other, as specified.

1,820.—Barometer Inkstand.—Thomas S. Hudson, East Cambridge, Mass. Patented May 4, 1861 :

I claim the improved barometric inkstand, as made of the glass cistern, arm and neck, and the metallic case and collar, constructed, arranged and combined together substantially as set forth.

I also claim the combination and arrangement of the semi-dome or tunnel, C, or the same and a cover, D, with the ink cistern and its neck, and so as to operate therewith substantially as specified.

1,821.—Machine for making Knitting-needles.—Thomas Sands, Gilford, N. H. Patented June 23, 1863. Ante-dated June 10, 1863 :

I claim the burr or equivalent cutter for slabbing that part of the wire which is to form the barb or beak of the needle, in combination with the means, or the equivalent thereof, for holding the wire by the eye which has been formed, substantially as described, that the flattening of the wire by the burr, or equivalent cutter, may be in proper relation to the eye.

I also claim the combination, substantially as described, of the means for forming the eye, the means for slabbing that part of the wire which is to form the barb or beak of the needle and the means for cutting off the wire, substantially as described.

I also claim the combination, substantially as described, of the means for straightening the wire, the means for forming the eye and holding the wire by the eye, the means for slabbing, and the means for cutting off the wire, substantially as and for the purpose specified.

And I also claim the combination, substantially as described, of the bed or block on which the wire is supported, during the operation of slabbing, the burr or equivalent cutter for slabbing the wire, the means described, or the equivalent thereof, for causing the burr cutter to act upon the wire in the direction of its length, and a cam or equivalent pattern to determine the motions of the burr or equivalent cutter, towards and from the wire, to determine the form of slabbing.

1,822.—Fire-proof Filling for Safes.—Wm. H. Butler, Alfred A. Valentine, and Sarah A. Holmes, New York City, administrators of the Estate of Richard G. Holmes, deceased, assignees of Richard G. Holmes, deceased, and Wm. H. Butler. Patented March 27, 1855 :

First, We claim a safe filling composed of broken or pulverized alum or equivalent crystalline material in a cold and dry state mingled with earthy matter, substantially in the proportions and for the purpose herein set forth.

Second, We claim the use of alum or equivalent crystalline material containing acid, in the filling of safes in combination with marble dust or an equivalent dry alkali, as a neutralizer or hardener, substantially as and for the purpose herein set forth.

Third, We claim, in connection with the above, as a new and useful improvement in fillings of safes or other fire-proof structures interspersing in the said filling a frame-work of solid substance, arranged substantially in the manner and for the purpose described.

DESIGNS.

1,998.—Ink-bottle.—Frederick Bailey, New York City.

1,998 to 2,003.—Carpet Patterns.—Elemir J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass. Five Patents.

[In the list of claims published for the week ending Oct. 22d, Mr. George Penfield's planing machine for working tackle blocks, chair seats, etc., was erroneously styled "a pearing machine."

Also, in list of claims for week ending Nov. 1st, Mr. John G. Baker (44,915, turning lathes), it was printed "of New York City." It should have been—Philadelphia, Pa.]

PATENTS

GRANTED

FOR SEVENTEEN YEARS.

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CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

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WM. D BISHOP.

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Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

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HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Governmen f es, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row New York.

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On filing each application for a Patent, except for a design.	$15
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The Patent Laws, enacted by Congress on the 2d of March, 1861, now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

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Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention

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Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.

Notes and Queries

A. S., of Md.—Several plants yield caoutchouc or india-rubber. In South America it is obtained chiefly from the *jatropha elastica*, and in the East Indies from the *ficus elastica*. The latter is the monarch of the forests wherein it abounds. One of the trees was found to be 74 feet in circumference. The poppy and lettuce also yield small quantities of caoutchouc. Gutta-percha is obtained from a large tree growing in the Malayan peninsula which has received the name *isonandra gutta*. Caoutchouc is a simple hydro-carbon with the composition, C8 H7, while gutta-percha is a hydro-carbon with the formula C40 H32, associated with two resins having the same formula, with the addition of two and four atoms of oxygen respectively.

W. H. S., of N. Y.—The size and weight of a fly-wheel must be in proper proportion to the machine which it is designed to regulate, and this is determined by observation and experience; it cannot be calculated by any mathematical rule. Within the limits usually adopted by mechanics our preference is for light wheels of large diameter, rather than for heavier ones of smaller diameter. The regulating power of fly-wheels is in proportion to their weight multiplied by the square of their velocity.

W. R. A. B., of Canada West.—The tin roof of your spire and church are doubtless sufficient conductors of electricity, and your 3-inch spouts we should suppose are also sufficient if carefully connected with the moist earth at their lower ends. But electricity is very apt to scatter, and if you wish to make very safe you might add one or two more conductors from the lower corners of the tin roof to the ground.

T. E. O., of Ohio.—You will find our views of perpetual motion fully set forth on pages 253 and 254, Vol. I, (new series) SCIENTIFIC AMERICAN. All matter in the universe is in constant motion. The term "perpetual motion" is applied in mechanics to all fallacies which suppose that an effect can be produced greater than the force employed.

C. R., of N. Y.—You will find information on wine in Colonel Haraszthy's treatise on the subject. Alcoholimetry is treated at length in Ure's Dictionary.

B. S. T., of Ill.—The most volatile portions of petroleum, called benzine or naptha by the dealers, will dissolve gutta-percha.

J. T. R., of N. Y.—There is no difficulty in confining air at a pressure of ten or fifteen atmospheres in iron vessels for weeks.

W. H. H., of Pa.—There is not the least novelty in your box valve arrangement. It is as old as the hills, and hundreds of them are in use in different parts of the country.

T. O. B., of Canada West.—We have never seen any offer by the British Government of a prize for trisection of angle by elementary geometry.

T. T., of D. C.—We always welcome any new matter from contributors, but your information in regard to the metal, mercury, has long been in books.

J. H. B., of Ohio.—Gerner's furnace, illustrated on page 344, Vol. IX, is said to consume the smoke.

E. B., of N. H.—We do not know that screw-heads have been made to countersink themselves.

F. W. B. & Co., of N. Y.—We advise you to advertise your steel belts in the SCIENTIFIC AMERICAN.

J. D. H., of Pa., and T. W. B., of Ohio.—We think our readers must have had enough of the subject of cycloids.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Nov. 9, 1864, to Wednesday. Nov. 16, 1864:—

R, S. F., of N. Y., $25; A. L., of N. Y., $25; A. A., of N. Y., $25; J. W. F., of Ill., $45; H. B. M., of Mich., $20; P. & W., of Cal., $20; W. C. McB., of N. J., $20; N. D. H., of Conn., $20; J. J., of N. Y., $45; C. R. M. W., of N. Y., $40; T. B., of N. Y., $20; A. S. M., of Ill., $20; P. W., of Ill., $20; M. B. & N. B. P., of Tenn., $25; B. B., of Conn., $15; L. B. T., of Mass., $25; C. L. B., of Conn., $15; D. C. H., of Pa., $25; J. E., of Colerodo, $15; C. S. D., of Vt., $25; J. W. D., of Mo., $25; M. B., of Ky., $16; P. & W., of Cal., $20; W. T., of N. Y., $40; J. S., of N. Y., $20; J. P. B., of Wis., $30; T. R., of Chili, $30; C. J. R., of Cal., $100; R. K., of Ill., $25; P. & R., of Vt., $30; J. H. P., of N. Y., $25; W. T., of N. Y., $50; S. E. T., of N. Y., $25; S. & P., of Ohio, $20; A. L. A., of N. Y., $10; A. E. K., of Pa., $45; E. F. W., of N. J., $20; M. F., of Conn., $45; N. H. B., of N. Y., $20; T. W. K., of N. Y., $15; N. M., of N. Y., $30; L. A., of N. Y., $20; B. A. H., of Cal., $50; W. T. H., of Maine, $25; J. S., of N. Y., $25; J. T. R., of Pa., $15; H. A. P. & Co., of Mass., $30; G. K. W., of Conn., $10; T. J. K., of Ohio, $35; G. W. S., of N. Y., $16; R. K., of Tenn., $25; C. H. R., of Maine, $25; J. Y., of N. Y., $15; W. B. C., of R. I., $40; R. McC., of Ill., $12; A. M. O., of Ill., $15; K. & W., of Ohio, $40; W K. L., of Mass., $20; H. & A., of N. Y., $25; D. L. M., of N. J., $40; S. & C., of N. Y., $25; W. S., of Ohio, $45; R. W. P., of Mass., $45; H. W. A., of N. Y., $20; G. E. W., of N. Y., $15; C. B., of Mich., $35; J. G. F., of Mass., $45; H. & A., of N. Y., $15; J. M. F., of Wis., $90; J. W. C., of N. Y., $20; L. & S., of N. J., $40; C. A. A., of Maine, $16; J. L. J., of Mass., $30; J. N. P., of N. Y., $25; S. & H., of Mass., $40; G. N. B., of Mich., $10; T. & T., of Mass., $30; A. M. O., of Ill., $25; F. H., of Ill., $16; G. W. B., of R. I., $30; J. D., of N. Y., $15; J. T. P., of N. Y., $40; J. L. R., of Ohio, $25; D. Z., of Ill., $25; D. S., of Mass., $46; E. R., of Mich., $37; O. E. R., of Maine, $30; T. W. K., of N. Y., $25.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, Nov. 9, 1864, to Wednesday, Nov. 16, 1864:—

R. S. F., of N. Y.; A. L., of N. Y.; A. A., of N. Y.; G. N. I., of Nevada; S. & H., of Mass.; T. J. K., of Ohio; L. B. T., of Mass.; C. S. D., of Vt.; W. T. H., of Maine; A. S. W., of Mass.; G. W. B., of R. I.; R. McC., of Ill.; J. P. B., of Wis.; H. & A., of N. Y.; J. H. P., of N. Y.; W. T., of N. Y.; S. E. T., of N. Y.; J. W. F., of Ill.; P. L. H., of N. Y.; R. K., of Tenn.; A. M. O., of Ill.; J. S., of N. Y.; C. H. W., of Wis.; J. N. P., of N. Y; W. T., of N. Y.; J. S. R., of Ohio; T. R., of Chili; T. W. K., of N. Y.; D. L. M., of N. J.; S. & C., of N. Y.; L. & G., of England; L. & S., of N. J.; J. & W. C. S., of Cal.; D. C. H., of Pa.; J. W. D., of Mo.; J. L. J., of Mass.; J. M. T., of Mass.; C. H. R., of Maine; A. W. L., of N. Y.; D. & Z., of Ill.

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CAVALRY BUREAU, OFFICE OF ASSIST. QUARTERMASTER,
No. 18 State street, New York, June 10, 1864.

I WILL PURCHASE IN OPEN MARKET ALL THE Calvary Horses that may be presented and pass inspection at the Government Stables, corner of 10th avenue and 25th street, in this city, until further notice.
Payment will be made in checks payable in certificates of indebtedness, when seven (7) or more horses are received. Price, one hundred and sixty dollars each.
6 tf GEO. A. BROWNING, Capt. and Assist. Qr. Mr

ENGINEERING, CIVIL AND MILITARY; CHEMISTRY, Metallurgy, Assaying, &c., at Union College, Schenectady N. Y. For Circular address Registrar. 24 1y*

REYNOLDS' TURBINE WATER WHEELS.—COMPETENT men are employed to measure streams, make plans, and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York. 16tf

TO ENGINE BUILDERS.—ALL PERSONS WHO may be building or using Steam Slide Valves, having two or more bars across the face, acting in combination with two exhaust ports to each end of the cylinder, are hereby notified that they must obtain a license to use the same under my Patent, dated Jan. 9, 1855, or they will be subject to prosecution for infringement. WILLIAM CLEVELAND HICKS, 480 Broadway, New York. 19 4

FOR SALE.—THE RIGHT OF FIVE STATES YET unsold of J Peffley's Economical Automatic Lath-cutter. Address JACOB PEFFLEY, Bainbridge, Putnam county, Ind. 16 4* cow

FOR SASH, BLIND, AND DOOR MACHINERY, address J. A. FAY & CO., or E. C. TAINTER, Succeeding Partner, Worcester, Mass. 10 b*

ROLL TURNER WANTED.—WE ARE IN WANT of a roll turner in our mill. To one that understands his business, who can come well recommended, and prove himself a *man*, we will give liberal wages and constant employment. POMEROY IRON CO., Pomeroy, Ohio. 19 4*

MACHINERY.—S. C. HILLS, No. 12 PLATT STREET New York, dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning and Sash Machines; Woodworth's and Daniels's Planers, Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting Oil, &c. c

SAVING OF FUEL TO PARTIES USING STEAM DAMPER REGULATORS.
Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms of flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 5 Park Place, New York 3 26*

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 1tf

A RARE CHANCE.—FOR SALE AT YOUR OWN price, the entire patents of my Wind-wheel and Governor, illustrated in No. 1, Vol. XI., new series, of the SCIENTIFIC AMERICAN. The inventor having other business which requires his whole attention, will sell the above patents on the most liberal terms. The Governor works equally well attached to any kind of machinery where a Governor is required. It is especially adapted to Water-wheels, it being very sensitive and giving a strong and positive movement. Copies of the illustration furnished on application. Address JOHN P. BURNHAM, Chicago, Ill. 21 3*

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Improved Adjustable Wrench.

This tool is of the class known as "monkey wrenches," as distinguished from other adjustable wrenches, which are shifted by screws. It is light but strong; the material is to be malleable iron, also wrought-iron and steel. The operation of it is easily understood at a glance; by merely pressing on the spring, B, the head, A, is eased up, and can be slipped, along with the spring, so as to enlarge or close the jaws of the wrench. The front end of the spring

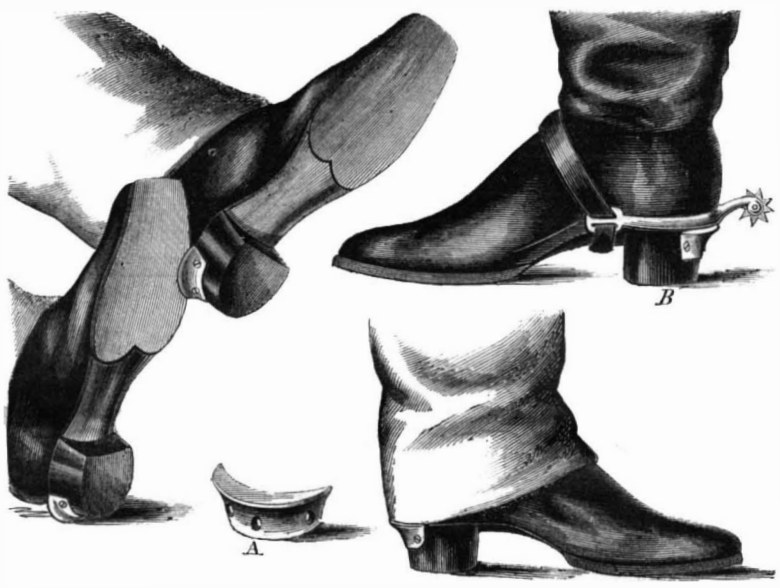
PENNEY'S ADJUSTABLE WRENCH.

takes in the ratchet teeth on the back of the head. This wrench cannot be used as a hammer, which is a very good feature. Wrenches are intended to screw and unscrew nuts and bolts, and hammers are for another and distinct purpose, but reckless men frequently ruin good screw and monkey wrenches by pounding with the hammer-head. When so used the shank gets bent and the jaw broken off; this wrench is liable to no such contingency, and is a very useful tool.

It was patented on Oct. 11th, 1864, by J. W. Penney, through the Scientific American Patent Agency, and assigned to Penney & Thurston. Address them for further information at Mechanic's Falls, Me.

New Boot-drawer and Pantaloon's Guard.

The difficulty experienced in pulling off a wet or tight boot is very much enhanced by the want of a



NEW BOOT-DRAWER AND PANTALOON'S GUARD.

foothold, or something to push against. Bootjacks supply this want when they are at hand, but people do not carry bootjacks about with them, and very often, as in traveling, or in camp, no such article can be found. This simple appliance to the heel of a boot is always in its place and available. It is fastened to the heel of a boot by screws, as shown in the separate views, and in detail at A. When not in use as a boot-drawer it supports the lower hem of the pantaloons and prevents them getting under the heel and trampled upon, a very common occurrence. Another use for this plate is shown at B. Cavalrymen generally put a small piece of leather on the heel of their boots, to prevent the spur from slipping down. This plate renders such makeshifts unnecessary, and serves as a most efficient bootjack in addition. For drawing off the boots alone it is a very convenient little article. It is made of either brass or japanned iron, and is entirely hidden by the pantaloons. The screws hold the several parts of the heel together, so that there is no danger of pulling it off, as with a boot jack.

A patent has been allowed on this article through the Scientific American Patent Agency. For further information regarding the sale of rights, etc., address the inventor, Egbert P. Watson, Box No. 773, N. Y. Post-Office. See advertisement on another page.

Charcoal having the Solidity and Texture of Mineral Coal formed under pressure.

We have received from Mr. Robert Safely, of Cohoes, New York, an account of the conversion of a portion of the wooden step of a turbine water-wheel into a very compact coal resembling closely in texture and appearance ordinary mineral coal, along with a specimen of the coal. The step was of oak, and about 10 inches through; and when taken out, the whole surface was covered with a layer of coal. The charring was a consequence of the water pipe which lubricated it becoming clogged with dirt. Mr. Safely states further, that the fall of water to which the wood was subjected when it was converted into coal, was exactly 25 feet; and as the diameter of the wheel is 5 feet 7 inches, the pressure on the wheel would be measured by a column 5 feet 7 inches in diameter and 25 feet high, less what is due to the water striking the bucket at a small angle to the lane of the wheel. The gearing, wheel, shaft, etc., weigh about 3 tons, which would give for the pressure upon the step, if the whole weight of water was reckoned, about 20 tons.

The facts exemplify the formation of coal under pressure, combined with moisture and a moderate heat, and with very slow motion—*Siliman's Journal*

Swiss Passenger Cars.

In Switzerland nothing can be more convenient than a railway carriage, to which the traveler gains access by ascending a few steps, leading to a sort of platform or balcony for smokers. Here a door opens into the interior, fitted up like a saloon, with a table in the middle, and seats all round; the passengers, instead of being cramped by sitting for hours in the same posture, can walk about, or write, or play at chess or whist, if they please. The seats are made so as to face opposite points of the compass, and everything is arranged on the most comfortable plan, with the only exception that the traveler desirous of solitude is not alone—a questionable comfort, which, as we but too well know, is fraught with danger.—*Engineer.*

GRAPES have ripened well in the open air at Quebec this year.

THE

Scientific American,

FOR 1864!

VOLUME ELEVEN

NEW SERIES.

The publishers of the SCIENTIFIC AMERICAN respectfully give notice that the Eleventh Volume (New Series) commenced on July 2d, 1864. This journal was established in 1845, and is undoubtedly the most widely circulated and influential publication of the kind in the world. In commencing the new volume the publishers desire to call special attention to its claims as

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